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Sunday Letter A - Golden Number

Easter Day April 9th 1882

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The ELEMENTS of CHRONOLOGY:

OR,

The CALENDAR Explained.

CONTAINING,

A DISCOURSE on the original Inſtitution of the *Julian* and *Gregorian* Accounts of TIME: The Indiction of the *Romans*, and *Julian* Period: Of the Æra or Year of CHRIST: Of the Olympiads of the *Greeks*: Of the Building of *Rome*: And of the *Turks* and *Arabs* Account, *&c.*

The Movable and Fix'd FEASTS throughout the Year; the Cycles of the Sun, and Moon; the Epact; Golden Number; Dominical Letter; Key-Day; Number of Direction, *&c.* all largely accounted for.

Likewiſe complete TABLES for finding *EASTER*, according to the Rule of the *Nicene* Council.

WITH

An APPENDIX, *ſhewing the moſt plain and eaſy RULES for* Menſuration *of* Superficies *and* Solids: *Alſo Arithmetical ARCHITECTURE.*

Together with various Uſeful TABLES.

All made Eaſy to the meaneſt CAPACITY.

By ROBERT SPURRELL,
SCHOOLMASTER in BATH.

BATH: Printed by B. LYONS, for the AUTHOR.

M.DCC.XXX.

WELLCOME
HISTORICAL
MEDICAL

To the Right Worſhipful

FRANCIS BAVE, Eſq;

MAYOR;

And to the Worſhipful

JOHN BILLING,
AND
THOMAS ATWOOD,
Eſquires, *JUSTICES*;

And the Reſt of the CORPORATION
of the CITY of *BATH*.

GENTLEMEN,

I Humbly preſume to take this Opportunity of expreſſing my grateful Acknowledgment of the many Favours already received; and to requeſt your Patronage and Protection of this ſmall Treatiſe: Well knowing that Books have their Deſtinies from human Affections, Humours, *&c.* and are liked or diſliked as the contrary Genius and different Diſpoſitions of Men do lead them.

I am

DEDICATION.

I am well aſſured that this Book (tho' none of the largeſt in Bulk) will be of far greater Advantage to the Reader, than at firſt Sight may appear; it being both profitable and delightful; for in it are contained ſeveral Compoſitions wholly New, both in Theory and Practice: Which gives me Hopes that it may meet a kind Reception.

I don't wonder to ſee almoſt every Pamphlet crouch and deject itſelf with all Humility and Lowlineſs, in ſeeking Patronage from Perſons of high Rank and Eminency; ſince the meaner Shrubs are powerfully ſheltered under the ſpreading Branches of the lofty Cedars.

Thus I, being influenced by YOU, like the Sun's warm Rays enlivening the decaying Plants in Spring, whoſe Branches are wither'd and drooping thro' the ſharp and piercing Froſts of the chilling Winter, am conſtrained to repeat my weak, but ſincere Endeavours, as a ſmall Return for Your great Obligations: Whilſt I am, with all due Reſpect,

GENTLEMEN,

Your Moſt Obedient,

And Moſt Devoted

Humble Servant,

R. SPURRELL.

PREFACE.

It may be expected that I ſhould (according to Cuſtom) give the Reader ſome particular Account of the enſuing Treatiſe, and of the Reaſons which induced me to publiſh a Book of this kind, ſince ſeveral earlier Pens have touch'd on the ſame Subject: Of which I am not ignorant, knowing that many Ingenious Authors have already writ on the ſame Head: But let me add, that thoſe Authors have treated only Occaſionally of this, among other Things; whereby their Works are rendered too large, both in Volume and Price; which Inconveniences I have in this much abbreviated.

2. *I have endeavoured to perform each particular Problem in as conciſe a manner as the Rule would bear; yet ſo as to make it intelligible and plain to the meaneſt Capacity, provided they can read the Bible: As to the* Prime *or* Golden Number, *the* Dominical *or* Sunday Letter, *and* Key-Day *or* Firſt of March, *the* Cycles *or* Circles *of the* Sun *and* Moon, *and the* Epacts *of the* Moon, *with the* Roman Indiction, *the* Olympiads *of the* Greeks, *the* Nicene Rule *for finding* Eaſter, *&c. they are all comprehended within the Compaſs of the four firſt Rules of Vulgar Arithmetic. And for that admirable Number call'd the* Number of Direction, *whoſe Uſe is to find the Movable Feaſts, (and to find which requires the Extraction of Roots) you have that Trouble here ſaved, by having a Table ready calculated in this Book, whereby you may at any Time (or*

for any Year to come) by Inſpection find the Day of the Month that any of theſe Feaſts fall on.--- Likewiſe the various Tables found throughout this Treatiſe, are rendered ſo plain and eaſy, by Examples of each kind, that I think nothing can be more intelligible :--- Several of which Tables I have taken Pains to calculate over again, (which I had from other Authors) and duly corrected them.--- I have alſo been highly obliged to the worthy Mr. Richard Neve, *and others; but eſpecially to that Ingenious Writer Dr.* Wells, *a Tranſcript of whoſe* Chronology *I have rendered down to this preſent Year* 1730.

3. *As to that Part of the Appendix relating to* Menſuration of Superficies and Solids, *I have taken care to inſert ſeveral Examples of each kind, wrought by Vulgar Arithmetic, by Decimal Fractions, and by Croſs Multiplication :--- I have alſo given an eaſy and ſhort Method of working Queſtions by Aliquot Parts; and alſo of working Yards and Feet by Yards and Feet, giving the Product in Square Yards at one Operation.---- I had Thoughts of adding ſome few Pages of Duodecimal Menſuration; but fearing the Book would ſwell beyond its intended Bounds, I have omitted them; hoping that what is already contained in it will give the Reader general Satisfaction, eſpecially if he is a Lover of Learning;--- but from thoſe that are not, I may expect their Cenſure; and to ſuch, I ſhall conclude with the Poet :*

'Tis nothing new, nor does it come by Chance,
That Art is envy'd ſtill by Ignorance.

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The

The ELEMENTS of
CHRONOLOGY;
OR,
The *CALENDAR* EXPLAINED.

I. *Of the PRIME, or GOLDEN NUMBER.*

THE GOLDEN NUMBER is a Periodical Revolution of 19 Years; in which Time all the Lunations or Aſpects of the Sun and Moon are made, and return to the ſame Point they were at 19 Years before: Which is in a manner true, but not exactly ſo; for in 19 Years there is an Anticipation of an Hour and a half, very near, wanting but 75 Seconds. Wherefore look what Conjunction happens this Year in Aries at Noon, will, 19 Years hence, be an Hour and half before Noon. This Circle is call'd DECEM NOVENALIS CIRCULUS, whoſe Parts are call'd the GOLDEN NUMBER, becauſe at firſt they were written with Golden Characters in Tables of Silver, and ſo ſent to Rome, or for that they uſed to be written in Red or Golden Letters in the Calendar. Now to find this Number, obſerve this general Rule; add 1 to the Year of the Lord in which you ſeek for it, and dividing the Sum by 19, the Remainder will be the Prime or Golden Number; or if nothing remain, then 19 is the Golden Number.

For EXAMPLE.

To this preſent Year 1729, add 1 is 1730, which divided by 19, there remains 1, which is the Golden Number: Or had it been required to find the Golden Number in the Year 1728, the Operation performed as before, where in this Example 0 remains. See the Work.

1729
1
19) 1730 (91
2(1 G.Nu.

1728
1
19) 1729 (91
1 (0

So that when nothing remains after Diviſion is ended, then the Golden Number is always 19.

Then by knowing the aforeſaid Prime or Golden Number, you may from thence find the Number call'd the EPACT, whoſe Uſe is principally to find the Age of the Moon, as I ſhall ſhew hereafter. Now to find the EPACT Arithmetically, take this general Rule; Multiply the Prime or Golden Number by 11, and divide the Product by 30, the Remainder after Diviſion is ended, is call'd the Epact: But if the Golden Number is 1, as it happens to be this preſent Year 1729, ſeeing that 1 does neither multiply nor divide, therefore, conſequently, 11 muſt be the Epact. Now (as I ſhall elſewhere ſhew) if the Golden Number be either 3, 6, 9, 12, 15, or 18, that then the Epact is the ſame.

The Epact, and its original Inſtitution, is explain'd in another Place in this Book, to which I refer.

By the 19 *Epacts to find the Day of* Eaſter Limit, *from the Beginning of* March *incluſively.*

NOTE, That if the Epact be any Number from 1 to 27, incluſively, ſubſtract that from 47, and it gives you the Number of Days contain'd in Eaſter Limit; or, which is all one, the Number of Days ſucceeding the Firſt of March; for if the End or Expiration of this Number of Days of the Limit (whether they be more or leſs) do fall on a Sunday, then that is Eaſter Day: But if the Expiration of Days call'd the Limit, do happen on a Monday, Tueſday, &c. then the Sunday following that is Eaſter Day.

EXAMPLE. In 1729 the Epact is 11, that ſubſtracted from 47, leaves 36, which, from the Beginning of March incluſively, falls on the 5th of April, and the next Day is Eaſter Day, as it happens to be on a Sunday; for if the 5th of April had been on a Monday, Tueſday, &c. Eaſter Day had been the Sunday following.

Examp. 1729
47 Numb.
11 Epact
36 Days of the Limit.

NOTE farther, That there are the two laſt and greateſt Epacts, which are 28 and 29. Now if the Epact happens to be either of them, then you muſt inſtead of 47 make uſe of 77, which Number ariſes by adding 30 to 47, and makes 77.

For EXAMPLE. In the Year 1728 the Epact being 29, you muſt uſe the Numbers as per Example.

77 Number.
29 Epact ſub.
48 Remainder.

So that counting 48 Days forward from the Beginning of March incluſively, and it falleth on the 17th Day of April, and the Sunday following that being the 21ſt of April, is Eaſter Day. Note, That 77 is only uſed with the two greateſt Epacts, (viz.) 28 and 29; for any other Epacts you muſt uſe 47, as above.

II. *Of the* Cycle of the Sun *and* Dominical Letter, *and how to find them.*

THE CYCLE OF THE SUN is nothing elſe but a Revolution of 28 Years; in which Time the DOMINICAL LETTERS make all their ſeveral Changes; and it is call'd the Cycle of the Sun, not for that it ſheweth any Motion of the Sun, but becauſe by means thereof the Dominical (or Sunday) Letters are always found: This Cycle always comprehending all the Varieties and Changes the Sunday Letter can have, by reaſon of the *Biſſextile* or Leap-Year.

Now to find what this Cycle is in any Year, add 9 to the Year of the Lord in which you ſeek for it, and dividing the ſame by 28, the Remainder will be the Cycle of the Sun for that Year; but if nothing remain, then you may conclude that the Cycle is 28. A farther Explanation of which you may find in the following Sheets. And as for the Dominical Letter, it is always one of theſe ſeven, (viz.) A B C D E F G, which do ſhew the Sunday Letter, or Day of the Sun, all the Year, unleſs it be in a Biſſextile or Leap-Year; for then there are two Dominical Letters, the firſt whereof ſerveth for the Time from the Beginning of January to the Eve of S. Matthias, and the other to the Year's End.

A TABLE *to find the* Cycle of the Sun *and* Dominical Letter.

Cycle of the Sun	1	2	3	4	5	6	7	8	9
Dominic. Letter	G F	E	D	C	B A	G	F	E	D C
Cycle of the Sun	10	11	12	13	14	15	16	17	18
Dominic. Letter	B	A	G	F E	D	C	B	A G	F
Cycle of the Sun	19	20	21	22	23	24	25	26	27
Dominic. Letter	E	D	C B	A	G	F	E D	C	B
Cycle of the Sun	28								
Dominic. Letter	A								

A moſt ready and plain TABLE *to find* Eaſter Day *for ever, by the Golden Number and Dominical or Sunday Letter.*

G.N.	A	B	C	D	E	F	G
I.	April 9	Apr.10	Apr.11	Apr.12	Apr. 6	Apr. 7	Apr. 8
II.	Mar.26	Mar.27	Mar.28	Mar.29	Mar.30	Mar.31	Apr. 1
III.	Apr.16	Apr.17	Apr.18	Apr.19	Apr.20	Apr.14	Apr.15
IV.	April 9	Apr. 3	Apr. 4	Apr. 5	Apr. 6	Apr. 7	Apr. 8
V.	Mar.26	Mar.27	Mar.28	Mar.29	Mar.23	Mar.24	Mar.25
VI.	Apr.16	Apr.17	Apr.11	Apr.12	Apr.13	Apr.14	Apr.15
VII.	Apr. 2	Apr. 3	Apr. 4	Apr. 5	Apr. 6	Mar.31	Apr. 1
VIII.	Apr.23	Apr.24	Apr.25	Apr.19	Apr.20	Apr.21	Apr.22
IX.	Apr. 9	Apr.10	Apr.11	Apr.12	Apr.13	Apr.14	Apr. 8
X.	Apr. 2	Apr. 3	Mar.28	Mar.29	Mar.30	Mar.31	Apr. 1
XI.	Apr.16	Apr.17	Apr.18	Apr.19	Apr.20	Apr.21	Apr.22
XII.	Apr. 9	Apr.10	Apr.11	Apr. 5	Apr. 6	Apr. 7	Apr. 8
XIII.	Mar.26	Mar.27	Mar.28	Mar.29	Mar.30	Mar.31	Mar.25
XIV.	Apr.16	Apr.17	Apr.18	Apr.19	Apr.13	Apr.14	Apr.15
XV.	Apr. 2	Apr. 3	Apr. 4	Apr. 5	Apr. 6	Apr. 7	Apr. 8
XVI.	Mar.26	Mar.27	Mar.28	Mar.22	Mar.23	Mar.24	Mar.25
XVII.	Apr.16	Apr. 3	Apr.11	Apr.12	Apr.13	Apr.14	Apr.15
XVIII.	Apr. 2	Apr.	Apr. 4	Apr. 5	Mar.30	Mar.31	Apr. 1
XIX.	Apr.23	Apr.	Apr.18	Apr.19	Apr.20	Apr.21	Apr.22

EXAMPLE

EXAMPLE and USE.

When you have found the Dominical or Sunday Letter in the uppermoſt Line, guide your Eye downward from the ſame till you come right over-againſt the Prime or Golden Number, noted by the Letters G. N. and there is ſhewed both what Month and what Day of the Month Eaſter falleth that Year.

As for EXAMPLE. The Sunday Letter this Year 1729 is E, and the Golden Number is 1; I find E in the Head of the Table, and guiding my Eye downward in that Column till I come right againſt 1, being the firſt Figure on the Side under the Title G. N. I find Eaſter to be April the 6th. The like Method is to be obſerved for any other Year.

And NOTE, That when the Golden Number is either 5, 13, or 16, and the Dominical or Sunday Letter G, that then Eaſter Day falleth on March 25, or our Lady Day; but when the Golden Number is 8, and the Dominical Letter C, then Eaſter Day falleth on the 25th of April, or S. Mark's Day.

NOTE alſo, That Eaſter Day ever falleth between the 21ſt of March and the 26th of April; but thoſe two Days are to be excluded, for it never falleth on them, but between them.

Of the Prime of the Moon.

THE Moon is ſaid to be Primed when ſhe is three Days old and 18 Hours; being then in her Half Quarter, and four Parts of the Compaſs Eaſtward from the Sun, &c. This is to be obſerved amongſt the Country People, as a Rule to guide them in weaning of their Cattle.

IV. *Of the LEAP-YEAR.*

THE LEAP-YEAR is every fourth Year, which hath one Day more in it than a common Year hath, by reaſon of the odd ſix Hours that are over and above 365 Days in every Year; which in four Years makes up a Day, and which Day is added after the 28th of February; ſo that in the Leap-Year February hath 29 Days.

Here NOTE, That the Prime, Dominical Letter, and Cycle of the Sun, change the Firſt of January, but the Epact the Firſt of March.

To know if it be Leap-Year, or what Year paſt, take this general Arithmetical Rule: Divide the Year of our Lord by 4, the Remainder (if any) after Diviſion is ended, ſhews the Number of the Year ſince the Leap-Year, otherwiſe call'd Biſſextile, becauſe then they ſaid twice the ſixth Calends of March: For Inſtance, I would know for this preſent Year 1729, whether it is Leap-Year, or what Year paſt; according to the Example annexed for this preſent Year, I find 1 to remain, which ſhews that it is the firſt after Leap Year.

4) 1729 (432
1
(1 Year.

EXAMPLE II.

In the Year 1732, after having divided by 4, I find nothing remain, ſo that I conclude it to be the Biſſextile or Leap-Year.

(4 1732 (433
11
(0

For the Day of the Month on which the Sun *enters the Twelve Signs, obſerve the following Rule.*

Twice 9, twice 10, four 12, then 11,
Then 10, then 9, then 8 or 7.

EXAMPLE.

Aries,	Taurus,	Gemini,	Cancer,	Leo,	Virgo,	Libra,	Scorpio,
March.	April.	May.	June.	July.	Aug.	Sept.	Octob.
9	9	10	10	12	12	12	12

Sagittarius,	Capricorn,	Aquarius,	Piſces.
Novemb.	Decemb.	Jan.	Feb.
11	10	9	8

For the Degree of the Sun's *Place on any Day.*

From the Day of the month on which the Sun's Place is required, if you can, or otherwiſe from the Sum of that and 30, ſubſtract the Day of his Entrance into the Sign of that month, the Remainder ſhall be the Degree of his Place in that or the next preceding Sign.

EXAMPLE. Suppoſe on the 6th Day of March 1729, I would know in what Degree of the Sign the Sun is; therefore, according to the Rule, put 30 to it, which makes 36, from which if you take 9, the Day of the Sun's Entrance into the Sign in that month, there remains 27, which ſhews that the Sun is in 27 Degrees of the preceding Sign, which is Aries.

To find the Day of the Month by the following Table.

Obſerve in the Long Table againſt the Date of the Year 1729, Sa. or Saturday, which is Key-Day, then look in the foregoing Table, and all thoſe Days in the Table are Saturdays in thoſe months that are fix'd over them; for Inſtance, the 1ſt, 8th, 15th, 22d, and 29th of March or November are Saturdays, and in Auguſt the 2d, 9th, 16th, 23d, and 30th are Saturdays; and ſo of all the reſt. I would know what Day of the month the ſecond Sunday in Auguſt falleth, I find the 9th Day to be on a Saturday; then Sunday

To find the Number of Direction, or Day of the Week on which the Firſt of March falleth, commonly (and not improperly) call'd KEY-DAY; for by the help of this Number the Key-Day, or Firſt of March is eaſily found, by Inſpection in the following ſmall TABLE, where you have againſt each particular Year of our Lord the Key-Day, or Firſt of March; as againſt the Year 1729, Sa. or Saturday, which is the Day of the Week that the Firſt of March falleth on: So that it appears that in 28 Years the whole Revolution of Key-Days are completed, and in 1757 the Firſt of March falleth on a Saturday as before; and ſo on ſucceſſively 28 Years more.

Mar. Nov.	Aug.	May Jan.	Oct.	April July	Sept. Dec.	June Feb.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	0	0	0	0
S	M	T	W	T	F	S

ALMANACK.

1756	1	Fr.	†
1755	1	We.	
1754	1	Tu.	
1753	1	Mo.	
1752	1	Su.	†
1751	1	Fr.	
1750	1	Th.	
1749	1	We.	
1748	1	Tu.	†
1747	1	Su.	
1746	1	Sa.	
1745	1	Fr.	
1744	1	Th.	†
1743	1	Tu.	
1742	1	Mo.	
1741	1	Su.	
1740	1	Sa.	†
1739	1	Th.	
1738	1	We.	
1737	1	Tu.	
1736	1	Mo.	†
1735	1	Sa.	
1734	1	Fr.	
1733	1	Th.	
1732	1	We.	†
1731	1	Mo.	
1730	1	Su.	
1729	1	Sa.	

But for a general Rule to find the Key-Day, take this following Method; to the Number 2 add the Year of our Lord, and a fourth Part thereof, neglecting the odd Remainder, when there is any; the Total Sum of theſe three Numbers divided by 7, the Remainder, when the Diviſion is finiſhed, ſhews the Number of Direction, or Day of the Week on which the Firſt Day of March falleth, accounting the Lord's Day the firſt; but if nothing remain, it falls on a Saturday.

EXAMPLE for this preſent Year 1729.

By this Rule there will be found to remain 0 for the Year 1729; whence it follows, that the Firſt Day of March fell on a Saturday.

2
1729
432
7)2163(309 Quo.
(0 Remaind.

So in the Year 1730, there remains 1 for the Firſt or Lord's Day; in 1731 there remains 2 for Monday; in the Year 1732 there remains 4 for Wedneſday.

2
1730
432
7)1264(309 Quo.
(1 Remaind.

So that hence it may be obſerved, that every 4 Years the Key-Day, or Firſt of March, proceeds 5 Days; upon which Suppoſition the former Rule is built: Say then, by the Rule of Proportion, as 4 to 5, or as 1 to 1 1 4th, ſo is the Year of our Lord propounded, to the Number of Days the Firſt of March hath proceeded in all that Tract of Time; cauſed by the odd Day in each Year, and the Acceſs of the Days for the Leap-Years; this Number being divided by 7, the Remainder ſhews the Fractionate Part of a Week above whole ones, which the ſaid Day hath proceeded, which will not agree with the Day of the Week the Firſt of March falls upon, according to common Tradition, unleſs the Number 2 be added thereto, which argues that the Firſt of March, as we now account the Days of the Week, fell on a Monday, or the ſecond Day of the Week, in the Year of our Lord's Nativity. This is only for Illuſtration of the former Rule, being to ſhew that the adding of the even fourth Part of the Year of our Lord thereto, works the Proportion of 4 to 5.

2
1731
432
7)2165(309 Quo.
(2 Remaind.

2
1732
433
7)2167(309 Quo.
(4 Remaind.

The Uſe of the foregoing ALMANACK is, to know for ever on what Day of the Week any Day of the month falls upon; and for the due placing the months over the Column of Days, take the following Rule, according to the Ingenious Mr. MICHAEL DAVIE, in his own Words.

Firſt having March aſſign'd to lead the Round,
The reſt o'th' Months are eaſily after found;
For if you take the Complement in Days,
To Thirty-five of a plac'd Month, always,
And count it from its Place with due Progreſſion,
It ſhews you where the next Month takes Poſſeſſion.

Which is explain'd thus: Placing the month of March firſt, then if I would place April or the ſecond month, March having 31 days, the Complement thereof to 35 is 4; then counting 4 Columns from the place of March, it falls upon the 5th Column, where the figure 2 ſtands for the ſecond month; then April being placed, if I would place May, I take 30, the number of days in April from 35, there remains 5; then counting 5 Columns from the place of April, where it ends, which is in the 3d Column, the figure 3 is placed for the 3d month, or month of May.

The next Thing to be known is, on what Day of the Week the Firſt day of March falleth on, which is always to be remember'd in uſing the Almanack. But for the performing or finding this, I have given a general Rule in the foregoing Almanack.

So that remembering on what Day of the Week the Firſt Day of March fell upon in the Year propounded, (which doth then begin in the Uſe of this Almanack, and not ſooner or later, as upon New-Years day or Quarter-day) all the Figures repreſenting the days of the month do alſo repreſent the ſame day of the week, in the reſpective months under which they ſtand, and the converſe, the month being aſſigned, all the Figures which ſtand as the days under it, inform you what days of the ſaid month the week day ſhall be, the ſame as it was upon the Firſt day of March; and then by a due Progreſſion it will be eaſy to find upon what day of the month any day of the week falleth, as well as by a common Almanack, without the Trouble of always one, and ſometimes two Dominical Letters, which is quite ſhunn'd in this Almanack, by beginning the Year the Firſt of March, and ſo the odd day for Leap-Year is introduced between the End of the Old and the Beginning of the New Year.

EXAMPLE. In this preſent Year 1729, looking in the Column of months for the month of May, under it I find 3, 10, 17, 24, 31. Now the Firſt of March being Sa. or Saturday, I from thence conclude, that theſe reſpective days are likewiſe on a Saturday, or that they are all the Saturdays in that month of May, and from hence collect that Chriſtmas-day, which is always the 25th of December, happen'd on a Thurſday; and ſo of the reſt.

Here follows the TABLE in another Form, ſomewhat differing from the former, viz.

March	1	8	15	22	29	Novemb.
Auguſt	2	9	16	23	30	Auguſt
May	3	10	17	24	31	January
October	4	11	18	26	00	October
April	5	12	19	26	00	July
Septemb.	6	13	20	27	00	Decemb.
June	7	14	21	28	00	February

EXAMPLE. I know by this Table what day of the week Chriſtmas-day falleth on; I look for December, which I find link'd with September, and find that the 6th, 13th, 20th, and 27th, are Saturdays, and the 20th being the next Saturday before it, count 20 for Sat. 21 for Sund. 22 Mond. 23 Tueſd. 24 Wedneſd. 25 Thurſd. which Thurſday is Chriſtmas-day; and ſo of any other.

Having before treated of the Number of Direction, I ſhall here in another manner treat of it, giving you the general Uſe of a Number, which, for its Uſe and Excellence, may not improperly be call'd a Golden Number, for its wonderful Uſe in finding out the Moveable Feaſts; a Number (as Mr. NEVE well obſerves) that has been always thought impracticable to find it Arithmetically, and by ſeveral learned Authors: He gives a Solution, which I have here reduced into Practice, thus. For this preſent Year 1729.

25
11 Epact, which divided by 7, Rem. 4.
15 Fix'd Number.
4 the Rem. ſubſt. from 8, Rem. 4.

A	B	C	D	E	F	G
1	2	3	4	5	6	7

E Dom. Letter 1729.
5 Number of the Letter.
4 Subſtract.
1 Rem.
15 Fix'd Number added makes
16 being Number of Direction for this preſent Year 1729.

Note, That if the Subtrahend be more than the Number of the Dominical Letter, add 7, that Subſtraction may be made. And

Note farther, That if nothing remain, the Remainder muſt be accounted 7; alſo when the Epact is 28, add 2, or when it is 29, ſubſtract 5 from the Subtrahend, the Sum or Remainder is the true Subtrahend in thoſe Years: When there is two Dominical Letters, uſe the laſt of them.

Take this for a general Rule, viz. That

The ſame day	before	Eaſter	is	Shrove-ſunday.
7 weeks	after	Eaſter	is	Whit-ſunday.
A Fortnight before	Shrove-ſunday		is	Septuageſima.
A Fortnight before	Whit-ſunday		is	Rogation-ſunday.
And the Sunday after	Shrove-ſunday		is	Quadrageſima.
And the Sunday after	Whit-ſunday		is	Trinity-ſunday.

Alſo Note, That whenſoever the Golden Number is 3, 6, 9, 12, 15, or 18, then the Epact is the ſame.

But if the Golden Number be	1	2	4	5	7	8	10	11	13	14	17	19
Then the Epact is	11	22	14	25	17	28	20	1	23	4	7	29

To find the Dominical Letter *Arithmetically.*

Obſerve this Rule: Take the Date of the Year in which you would find the Dominical Letter, and a fourth part, and the number 4, add theſe 3 numbers together, and divide their ſum by 7, the Remainder after diviſion is ended ſubſtract from 7, and the Remainder gives you the number of the Letter, and accounting

A	B	C	D	E	F	G
1	2	3	4	5	6	7

for Example, you may perceive the Remainder 2, which ſubſtracted from 7 reſts 5, which falls on the Letter E, being Dominical Letter this preſent Year 1729; and ſo of any other.

```
   1729
    432
      4
7)2165(309
  2    (2 Rem.
  5
```

A TABLE

A TABLE *for the ready finding the* Number of Direction; *whoſe Uſe is as followeth.*

Firſt find the Prime or Golden Number, in the Column entitled Pr. or Prime, and the Dominical Letter in the Head or Foot of the Table, and in the Angle of Meeting you have the Number of Direction for the Year ſought.

Pr.	A	B	C	D	E	F	G
19	33	34	28	29	30	31	32
18	12	13	14	15	9	10	11
17	26	20	21	22	23	24	25
16	5	6	7	1	2	3	4
15	12	1	14	15	16	17	18
14	26	27	28	29	23	24	25
13	5	6	7	8	9	10	4
12	19	20	21	15	16	17	18
11	26	27	28	29	30	31	32
10	12	13	7	8	9	10	11
9	19	20	21	22	23	24	18
8	33	34	35	29	30	31	32
7	12	13	14	15	16	10	11
6	26	27	21	22	23	24	25
5	5	6	7	8	2	3	4
4	19	13	14	15	16	17	18
3	26	27	28	29	30	24	25
2	5	6	7	8	9	10	11
1	19	20	21	22	16	17	18
Pr.	A	B	C	D	E	F	G

EXAMPLE.

The Number of Direction is required for this preſent Year 1729, I look for the Prime or Golden Number, which this Year is 1, which I find at the Bottom, and the Dominical or Sunday Letter is E, wherefore in the Angle of Meeting I find 16, which is Number of Direction.

And Note further, That if the Number of Direction is ſought in a Leap-Year, you muſt enter the Table with the laſt of them, becauſe the firſt is out of Date the 24th of February, and the Number of Direction begins not until the 22d day of March.

You are to do the ſame for any other Time, and you have your deſire.

I have obſerved in an Almanack printed for this preſent Year, by an eminent Author, where he makes the Number of Direction to be 35, which is entirely falſe, it being but 16.

To find the Moveable Feaſts *by the help of the* Number of Direction, *viz.*

Add the Number of Direction to

Jan. 31.		Shrove-ſunday.
Feb. 7.		Firſt Sunday in Lent.
Mar. 21.		Eaſter-Day.
Apr. 7.		Eaſter Term begins.
Apr. 25.		Rogation-ſunday.
Apr. 29.	and you have	Aſcenſion-day.
May 3.		Eaſter Term ends.
May 9.		Whit-ſunday.
May 16.		Trinity-ſunday.
May 21.		Trinity Term begins.
June 9.		Trinity Term ends.

To render this more eaſy, obſerve the following directions.

Having found the Number of Direction for the Year propoſed, add that Number to any of theſe Numbers above ſpecified, and you have your deſire.

EXAMPLE. I would know on what day of the month Eaſter-Day happens this preſent Year 1729. I find above, oppoſite to Eaſter-Day, March 21, to which I add the Number of Direction 16, from which I take 10, to make good the month of March, there remains 6, which ſhews that Eaſter-Day will fall on the 6th of April in 1729.

To find the Age of the Moon, *or the Day of her Full and Change, any Month in the Year.*

Obſerve the following Rule.

Feb. Mar. Ap. Ma. Ju. Jul. Aug.
To Jan. 0 2 1 2 3 4 5 6
Sep. Oct. Nov. Dec.
8 8 10 10 theſe to the Epact fix;
The ſum (bate 30) to the month-day add,
Or take from 30, Age or Change is had.

Which Verſe is thus explain'd:

Add to the Epact for Jan. 0, for Feb. 2, March 1, &c. ſo that when the Epact is added to any of theſe Numbers, the ſum, if it be leſs than 30, is the Age of the Moon, with the day of the month added to it; or if thoſe 3 Numbers, when added together, exceed 30, then the Exceſs above 30 is the Moon's Age.

Example. I would know the Moon's Age on this preſent 11th day of March, 1728-9: Firſt I take the day of the month, which is 11, and the Epact, which for this preſent Year is alſo 11, and the Number 1, which is the Number appropriated to this month of March; the ſum of theſe 3 Numbers added together makes 23, which is the Age of the Moon: But if thoſe 3 Numbers being added together, their ſum exceed 30, then the Exceſs above 30 is the Moon's Age.

Then having the Moon's Age, multiply that by 4, and divide by 5, gives the Time of her Southing; what remains each 1 is to be accounted 12 minutes: But if the Quotient amounts to more than 12 hours, then the Exceſs above 12 is the Time of her Southing after 12 o' clock at night, or in the morning.

11 day of the month.
11 the Epact.
1 for March.
23 d. Age of the Moon.
4
5)92(18 Exc. above 12 is 6.
4 12
(2 6 h. 24 m. in morn.

A TABLE *ſhewing by the Help of the* Dominical Letter *what Day of the Week any Month of the Year begins upon for ever.*

		A	B	C	D	E	F	G
31	Jan.	Sund.	Saturd.	Friday	Thurſ.	Wedn.	Tueſd.	Mond.
28	Feb.	Wedn.	Tueſd.	Mond.	Sund.	Saturd.	Frid.	Thurſ.
31	Mar.	Wedn.	Tueſd.	Mond.	Sund.	Saturd.	Frid.	Thurſ.
30	April	Saturd.	Friday	Thurſ.	Wedn.	Tueſd.	Mond.	Sund.
31	May	Mond.	Sund.	Saturd.	Frid.	Thurſ.	Wedn.	Tueſd.
30	June	Thurſ.	Wedn.	Tueſd.	Mond.	Sund.	Saturd.	Frid.
31	July	Saturd.	Friday	Thurſ.	Wedn.	Tueſd.	Mond.	Sund.
31	Aug.	Tueſd.	Mond.	Sund.	Saturd.	Frid.	Thurſ.	Wedn.
30	Sep.	Friday	Thurſ.	Wedn.	Tueſd.	Mond.	Sund.	Saturd.
31	Oct.	Sund.	Saturd.	Frid.	Thurſ.	Wedn.	Tueſd.	Mond.
30	Nov.	Wedn.	Tueſd.	Mond.	Sund.	Saturd.	Frid.	Thurſ.
31	Dec.	Friday	Thurſ.	Wedn.	Tueſd.	Mond.	Sund.	Saturd.
		A	B	C	D	E	F	G

To find what day of the week begins any month of the year, ſeek the Dominical Letter in the Head of the Table, and the month you would know in the Side, and in the angle of meeting you have your deſire.

Example. Admit I would know what week-day begins the month of April 1729; I find the Dominical or Sunday Letter for the Year propoſed to be E; wherefore looking for E in the Top or Bottom of the Table, and the month of April in the Left Hand Column, in the Angle of meeting you have Tueſd. or Tueſday. But admit it to be Leap-Year, you are to underſtand that then there are two Dominical Letters, the firſt of which holds good from the Firſt of January to S. Matthias day, which is the 24th of February, and the other all the Year after.

A TIDE TABLE.

		South and North.		S. W. and N. E.		S. S. W. and N. N. E.		S. W. by S. and N. E. by N.		N. E. and S. W.		S. W. by W. and N. E. by E.		W. S. W. and E. N. E.		W. by S. and E. by N.	
Moon's Age.		Queenboro. Portſmouth. Southampt.		Rocheſter. Malden. Aberdeen.		Graveſend. Downs. Scilly halfti.		Dundee. Lisbon. S. Lucas.		London. Tinmouth. Whitbay.		Barwick. Flamborou. Bridlington.		Scarborough. Cork haven. Dungarvan.		Newcaſtle. Humber. Dartmouth.	
		h.	m.	h.	m.	h.	m.	h.	m	h.	m.	h.	m.	h.	m.	h.	m.
1	16	12	48	1	33	2	28	3	3	3	48	4	33	5	18	6	3
2	17	1	36	2	21	3	0	3	51	4	36	5	21	6	6	6	51
3	18	2	24	3	9	3	54	4	39	5	24	6	9	6	54	7	38
4	19	3	12	3	57	4	42	5	27	6	12	6	57	7	42	8	27
5	20	4	00	4	43	5	30	6	15	7	0	7	45	8	30	9	15
6	21	4	48	5	33	6	18	7	3	7	48	8	33	9	18	10	3
7	22	5	36	6	21	7	6	7	51	8	36	9	21	10	6	10	51
8	23	6	24	7	9	7	54	8	39	9	24	10	9	10	54	11	39
9	24	7	12	7	57	8	42	9	27	10	12	10	57	11	42	12	27
10	25	8	00	8	45	9	30	10	15	11	00	11	45	12	30	1	15
11	26	8	48	9	33	10	18	11	3	11	48	12	33	1	18	2	3
12	27	9	36	10	22	11	6	11	51	12	36	1	21	2	6	2	52
13	28	10	24	11	9	11	54	12	39	1	24	2	9	2	54	3	39
14	29	11	12	11	57	12	42	1	27	2	12	2	57	3	42	4	27
15	30	12	00	12	45	1	30	2	15	3	00	3	45	4	30	5	15
		1		2		3		4		5		6		7		8	

The

The USE of the foregoing TIDE TABLE,

Is to find the Time of High Water at all thoſe Places expreſs'd at the Top of the Table, the Moon's Age being firſt known, as I have before directed; then find the ſame in the Left Hand Column, and under the Place required you will find the Time of High Water at any day of her Age.

For EXAMPLE. The Moon being 10 days old, I would know the Time of High Water at London Bridge; I look in the 5th Column at the Top of the Table, and there I find London, Tinmouth, Whitbay, then looking down the Left Hand Column for 10, the Moon's Age, and in the Angle of meeting I find it High Water at 11 o' Clock, the ſame time it would be High Water at 25 days old. But to know whether this Time of High Water be at 11 o'Clock in the Morning, or 11 o' Clock at Night, you are to obſerve, that all along before the Full the Moon comes to the South in the Afternoon or Evening, following the Sun; but all the time of her Decreaſe, ſhe comes to the South after Midnight, or in the Morning, being before the Sun.

V. *Of the* MOVEABLE FEASTS;

Or thoſe Feſtivals which, tho' they are celebrated on the ſame Day of the Week, yet have no fix'd Seat in the CALENDAR, but in ſeveral Years happen on ſeveral Days of the Month; of which kind, beſides EASTER and WHITSUNTIDE, &c. are all the LORD's DAYS in the Year, whereof many being call'd by particular ſtrange Names in our common Almanacks, (ſince if all the Almanack-makers themſelves can well underſtand them, I am of opinion that not One in a Thouſand of their Readers do,) for which Reaſon I have thought fit here to explain them.

FIRST, To begin with the Year; If there be any Sunday between the CIRCUMCISION of our LORD, call'd New-Years-Day, and Twelfth-Day, call'd EPIPHANY, [from the Appearance of the Star to the Wiſe Men] ſuch Sunday has no particular Name aſſigned it. The Sundays following EPIPHANY are noted in their Order, as the 1ſt, 2d, 3d, &c. Sundays after Epiphany, and are ſometimes more, ſometimes fewer, according as Eaſter falls high or low; for they muſt always be ended, and give place to SEPTUAGESIMA, which is always the 10th Sunday incluſively before Eaſter, and thence is ſo call'd, as being ſeventy days before it: ſo the next Sunday is call'd SEXAGESIMA, and the next after that QUINQUEGESIMA, call'd alſo (Dominica Bacchanaliorum) the Sunday of Revellers or Bacchanalians, becauſe

cauſe then, and in the Week following, many Chriſtians ſhew themſelves as mad as the drunken Worſhippers of Bacchus amongſt the Heathen; 'tis alſo (Eſto mihi) becauſe then the Introit was out of Pſalm xxx. ver. 3. beginning Eſto mihi. The Wedneſday in this Week is Dies Cinerum, or Aſh-wedneſday, being the Beginning of LENT, on which they were wont to beſprinkle their Heads with Aſhes. The next Sunday is QUADRAGESIMA, or the firſt Sunday in Lent, call'd alſo Invocavit, becauſe then is ſung that of the Pſalmiſt, Invocavit me, & ego exaudiam eum; He call'd upon me, and I will hear him. The ſecond Sunday in Lent is call'd Reminiſcere, for the ſame Reaſon, taken from Pſalm xxv. 6. Remember, O Lord, thy tender mercies, &c. The third, Oculi, from v. 15. of the ſame Pſalm, Oculi mei ſemper ad Dominum; Mine Eyes are ever towards the Lord. The fourth, Lætare, from that of Iſa. lxvi. 10. Lætare cum Jeruſalem; ſome call it, Dominica de Roſa, becauſe then the Pope holds a Golden Roſe in his Hand at Church before all the People; and others call it Dominica de Panibus, becauſe the Miracle of the five Loaves in the Goſpel is explain'd: This Day with us is generally term'd Mid-Lent Sunday. The fifth Sunday in Lent is call'd Judica, from Pſalm xliii. 1. Judge me, O God, and plead my Cauſe. The next is Palm-Sunday, ſo call'd from the Palm Branches which the People ſtrew'd before our Saviour entering Jeruſalem; 'tis likewiſe call'd Dominica Magna, for the great and ineffable Good wrought in the Week following for the Faithful; for the Friday next is GOOD FRIDAY, as the Day whereon our Bleſſed SAVIOUR ſuffered for the Sins of Mankind. Then comes EASTER Sunday, celebrated in Memory of our Saviour's Reſurrection, which is the Foundation and Rule for all the Moveable Feaſts. After this follows the Quinquageſimal, or ſpace of 50 Days between Eaſter and Whitſuntide, all which the antient Chriſtians kept as a Feſtival, containing ſix Sundays; the firſt, Quaſimodo Geniti, from that of 1 Pet. 2. 2. As New-born Babes, &c. 'tis alſo call'd Dominica in Albis, becauſe thoſe that were baptized at Eaſter uſed to go in white Garments all the Week, which this Day at Night they left off. The ſecond Sunday is call'd Miſericordia, from Pſal. xxxii. 5. The third is call'd Jubilate, from Pſalm lxv. 1. The fourth is call'd Cantate, from Pſal. xcvii. 1. The fifth, Vocem Jucunditatis, from the Introit that day beginning ſo; 'tis alſo call'd Rogation Sunday, and the whole Week after is call'd Rogation Week, becauſe then they made their Proceſſions into the Fields, ſaid the Litany, and made their Prayers and Requeſts (Rogationes) to GOD publickly. The Thurſday in this Week is HOLY THURSDAY, kept in Memory of our SAVIOUR's Aſcenſion into Heaven. The laſt is call'd Exaudi, from that of Pſal. xxvii. Hear, O Lord, my Voice. Then ſucceeds the

Grand Feſtival call'd by us WHITSUNTIDE, becauſe the People appeared in ſuch coloured Garments antiently; but in Greek, PENTECOST; which, as it was obſerved by the Jews in Memory of the Promulgation of the Law at Mount Sinai, juſt 50 Days after their Paſſover, ſo Chriſtians obſerve it the ſeventh Sunday after Eaſter, (call'd ſtill Paſcha) by Reaſon that then the Holy Ghoſt was ſent, and the Gift of Tongues conferr'd upon the Apoſtles. The next is TRINITY SUNDAY; and from thence the Sundays are reckon'd in Order, as firſt, ſecond, third, &c. after Trinity, to the firſt Sunday in Advent: Which Time of ADVENT, [or Coming] being a kind of Preparation for the Grand Feſtival of our LORD's Birth, contains the four Sundays next before Chriſtmas, and are reckon'd by number, as firſt, ſecond, &c. Sunday in Advent. And thus have I traced the Year round, in giving the Reader a brief, but particular Account, how both the Antients and Moderns have all along obſerved theſe Feaſts and Faſts; which I believe many would not have known, had they not met with it here.

The Uſe of the following TABLE of Dominical Letters.

FInd the Thouſands and Hundreds in the Top of the Table, and the odd ones, if any, that are leſs than 100, find in the Left Hand Side, and in the common Angle of meeting you have the Dominical or Sunday Letter or Letters for the Year ſought.

For EXAMPLE. I would know the Dominical or Sunday Letter for this preſent Year 1729; I look in the Top of the Table for 1700, which I find in the middle Column of the Top; then having found 1700, I look in the Left Hand Column for 29, then guiding my Eye forward till I come right under 1700, I find the Letter E, which I conclude is Dominical Letter for the Year 1729.

A TABLE *ſhewing the* Dominical Letter *from the Firſt Year of our Lord to the Year* 4100; *and may be continued for ever.*

	Per Sir SAM. MORELAND.			000 700 1400 2100 2800 3500	100 800 1500 2200 2900 3600	200 900 1600 2300 3000 3700	300 1000 1700 2400 3100 3800	400 1100 1800 2500 3200 3900	500 1200 1900 2600 3300 4000	600 1300 2000 2700 3400 4100
0	28	56	84	DC	ED	FE	GF	AG	BA	CB
1	29	57	85	B	C	D	E	F	G	A
2	30	58	86	A	B	C	D	E	F	G
3	31	59	87	G	A	B	C	D	E	F
4	32	60	88	FE	GF	AG	BA	CB	DC	ED
5	33	61	89	D	E	F	G	A	B	C
6	34	62	90	C	D	E	F	G	A	B
7	35	63	91	B	C	D	E	F	G	A
8	36	64	92	AG	BA	CB	DC	ED	FE	GF
9	37	65	93	F	G	A	B	C	D	E
10	38	66	94	E	F	G	A	B	C	D
11	39	67	95	D	E	F	G	A	B	C
12	40	68	96	CB	DC	ED	FE	GF	AG	BA
13	41	69	97	A	B	C	D	E	F	G
14	42	70	98	G	A	B	C	D	E	F
15	43	71	99	F	G	A	B	C	D	E
16	44	72		ED	FE	GF	AG	BA	CB	DC
17	45	73		C	D	E	F	G	A	B
18	46	74		B	C	D	E	F	C	A
19	47	75		A	B	C	D	E	F	G
20	48	76		GF	AG	BA	CB	DC	ED	FE
21	49	77		E	F	G	A	B	C	D
22	50	78		D	E	F	G	A	B	C
23	51	79		C	D	E	F	G	A	B
24	52	80		BA	CB	DC	ED	FE	GF	AG
25	53	81		G	A	B	C	D	E	F
26	54	82		F	G	A	B	C	D	E
27	55	83		E	F	G	A	B	C	D

A TABLE

A TABLE *to find the* Moveable Feaſts *for ever, by the* Dominical Letter *and* Golden Number.

Domin. Letter.	Golden Number.	From Chriſtmas to Shrove-ſunday.		Shrove-ſunday.	Eaſter-Day.
A	2 5 13 16	6 weeks		Feb. 5	Mar. 26
	7 10 15 18	7 w.		12	Apr. 2
	1 4 9 12	8 w.		19	9
	3 6 11 14 17	9 w.		26	16
	8 19	10 w.		Mar. 25	23
B	2 5 13 16	6 w.	1 day	Feb. 6	Mar. 27
	4 7 10 15 18	7 w.	1 d.	13	Apr. 3
	1 9 12 17	8 w.	1 d.	20	10
	3 6 11 14	9 w.	1 d.	26	17
	8 19	10 w.	1 d.	Mar. 6	24
C	2 5 10 13 6	6 w.	2 d.	Feb. 7	Mar. 28
	4 7 15 18	7 w.	2 d.	14	Apr. 4
	1 6 9 12 7	8 w.	2 d.	21	11
	3 11 14 10	9 w.	2 d.	28	18
	8	10 w.	2 d.	Mar. 7	25
D	16	5 w.	3 d.	Feb. 1	Mar. 28
	2 5 10 13	6 w.	3 d.	8	29
	4 7 12 15 18	7 w.	3 d.	15	Apr. 5
	1 6 9 17	8 w.	3 d.	23	12
	3 8 11 14 19	9 w.	3 d.	Mar. 1	19
E	5 16	5 w.	4 d.	Feb. 2	Mar. 23
	2 10 13 18	6 w.	4 d.	9	30
	1 4 7 12 15	7 w.	4 d.	16	Apr. 6
	6 9 14 17	8 w.	4 d.	23	13
	3 8 11 19	9 w.	4 d.	Mar. 2	20
F	6 16	5 w.	5 d.	Feb. 3	Mar. 24
	2 7 10 13 18	6 w.	5 d.	10	31
	1 4 12 15	7 w.	5 d.	18	Apr. 7
	3 6 9 14 17	8 w.	5 d.	24	14
	8 11 19	9 w.	5 d.	Mar. 2	21
G	5 13 16	5 w.	6 d.	Feb. 4	Mar. 25
	2 7 10 18	6 w.	6 d.	11	Apr. 1
	1 4 9 12 15	7 w.	6 d.	18	8
	3 6 14 17	8 w.	6 d.	25	15
	8 11 19	9 w.		Mar. 4	22

The Table *to find the* Moveable Feaſts, *&c.* *Continued.*

Rogat. ſunday.	Aſcen-ſion day	Whit-ſunday.	Trinity ſunday.	Advent ſunday.
Apr. 30	May 4	May 14	May 21	Dec. 3
May 7	11	21	28	3
14	18	28	June 4	3
21	25	June 4	11	3
28	June 1	11	18	3
May 1	May 5	May 15	May 22	Nov. 27
8	12	22	29	27
15	10	29	June 5	27
22	26	June 5	12	27
29	June 2	12	19	27
May 2	May 6	May 16	May 25	Nov. 28
9	13	23	30	28
16	20	30	6	28
23	27	June 6	June 13	28
30	June 3	13	20	28
Apr. 26	Apr. 30	May 10	May 17	Nov. 29
May 3	May 7	17	24	29
10	14	24	31	29
17	21	31	June 7	29
24	28	June 7	14	29
Apr. 27	May 1	May 11	May 18	Nov. 30
May 4	8	18	25	30
11	15	25	June 1	30
18	22	June 1	8	30
25	29	8	15	30
Apr. 28	May 2	May 12	May 19	Dec. 1
May 5	9	19	26	1
12	16	26	June 2	1
19	23	June 2	9	1
26	30	9	16	1
Apr. 29	May 3	May 13	May 20	Dec. 2
May 6	10	20	27	2
13	17	27	June 3	2
20	24	June 3	10	2
27	31	10	17	2

The Explanation of the preceding Table.

I Would know how the Movable Feaſts that are expreſſed in the Table fall out this preſent Year 1729: Having the Dominical or Sunday Letter, which, according to the Rule before given, I find to be E, then find the Prime or Golden Number, as in Page 2. which for this preſent Year is 1, and guiding your Eye along that Line, you will find that from Chriſtmas to Shrove-ſunday is 7 weeks 4 days; Shrove-ſunday is Feb. 16; Eaſter-Day April 6; Rogation-ſunday May 11; Aſcenſion-day May 15; Whit-ſunday May 25; Trinity-ſunday June 1; Advent-ſunday Novemb. 30.

The Uſe of the following Almanack.

I Should have given an Explanation of the following Almanack, but I think the ſucceeding Problem will be ſufficient, both as touching its Explanation and Uſe.

PROB. I. Having the Year of our Lord given, to find the Day of the Month.

I. Firſt find the Year you deſire, under the Title YEARS, and in the Top of the ſame Column ſtands the Dominical Letter anſwering to that Year.

II. Seek the Month you deſire againſt the Month before found, over which in the ſame Column ſtands all the Sundays in that month.

EXAMPLE. Suppoſe it were required to find what day of the month is the firſt Wedneſday in Auguſt, 1728.

Find 1728 in the Left Hand Table, where at the Top 'tis entitled Years, and in the uppermoſt Column but one, you will find 28, being next after L or Leap-Year, and over it you will find F, which is Dominical or Sunday Letter that Year; then at either Side amongſt the months find Auguſt, and from thence direct your Eye in the ſame Line 'til you find amongſt the Great Letters the Sunday Letter F; then over it in the ſame Column you have all the Sundays in that month, viz. 4, 11, 18, 25.

	YEARS.							SUNDAYS.							
	C	B	A	G	F	E	D	Mar. Nov.	Aug.	May Jan.	Oct.	April July	Sept. Dec.	June Feb.	
								1	2	3	4	5	6	7	
								8	9	10	11	12	13	14	
								15	16	17	18	19	20	21	
								22	23	24	25	26	27	28	
	1700							29	30	31					
January	L	20	21	22	23	L	24	A	B	C	D	E	F	G	Octob.
May	25	26	27	L	28	29	30	B	C	D	E	F	G	A	May
Auguſt	31	L	32	33	34	35	L	C	D	E	F	G	A	B	Auguſt
Feb. Nov.	36	37	38	39	L	40	41	D	E	F	C	A	B	C	March
June	42	43	L	44	45	46	47	E	F	G	A	B	C	D	June
Septemb.	L	48	49	50	51	L	52	F	G	A	B	C	D	E	Decem.
April	53	54	55	L	56	57	58	G	A	B	C	D	E	F	July
January	59	L	60	61	62	63	L	A	B	C	D	E	F	G	Octob.
May	64	65	66	67	L	68	69	B	C	D	E	F	G	A	May
								C	D	E	F	G	A	B	

A TABLE

A TABLE of Moveable Terms.

Dom. Lett.	Golden Number.	Eaſt. Ter. begins.	Eaſt. Ter. ends.	Trin. Ter. begins.	Trin. Ter. ends.
A	2 5 13 16	April 12	May 8	May 26	June 14
	7 10 15 18	19	15	June 2	21
	1 4 9 12	26	22	9	28
	3 6 11 14 17	May 3	29	16	July 5
	8 19	10	June 5	23	12
B	2 5 13 16	April 13	May 9	May 27	June 15
	4 7 10 15 18	20	26	June 3	22
	1 9 12 17	27	23	10	29
	3 6 11 14	May 4	3	17	July 6
	8 19	11	June 6	24	13
C	2 5 10 15 16	April	May 20	May 28	June 16
	4 7 15 18	April	17	June 4	23
	1 6 9 12 17	April	24	11	30
	3 11 14 19	May	31	18	July 7
	8	May	June 7	25	14
D	16	April	May 4	May 22	June 10
	2 5 10 13	April	11	20	17
	4 7 12 15 18	April	18	June 5	24
	1 6 9 17	April	25	12	July 1
	3 8 11 14 19	May	June 1	19	8
E	5 16	April	May 5	May 27	June 11
	2 10 13 18	April	12	30	18
	1 4 7 12 15	April	19	June 6	25
	6 9 14 17	April	26	13	July 2
	3 8 11 19	May	June 2	20	9
F	5 16	April	May 6	May 24	June 12
	2 7 10 13 18	April	13	31	19
	1 4 12 15	April	20	June 7	26
	3 6 9 14 17	May	27	14	July 3
	8 11 19	May	June 3	22	10
G	5 13 16	April	May 7	May 25	June 13
	2 7 10 18	April	14	June 1	20
	1 4 9 12 17	April	21	8	27
	3 6 14 12	May	28	15	July 4
	8 11 19	May	June 4	22	11

Eaſter Term hath five Returns, viz. 1. Quind. Paſch. 2. Tres Paſch. 3. Mens Paſch. 4. Quind. Paſch. 5. Craſt. Aſcenſ.

Trinity Term hath four Returns, viz. 1. Craſt. Trin. 2. Oct. Trin. 3. Quind. Trin. 4. Tres Trin.

The

The ROMAN INDICTION,

WAS a Space of Fifteen Years, in which Time the Roman Tribute throughout all the Empire being Indicted, that is, appointed and limited to be paid in, they uſed to reckon and date their Writings ſuch a Year of the Indiction.

To find this Year of the Indiction for any Year of our Lord, add 3 to the Year of our Lord, and divide the ſum by 15, what remains beſide the Quotient is the Year of the Indiction; but if nothing remain, then 15 is the Number of the Indiction.

EXAMPLE.

This Computation began in the Year of Chriſt 313.

1729
3
15) 1732 (115
28
(7 Indiction.

Now as the Romans uſed to reckon and obſerve any memorable Accidents by the Time of their Indiction, ſo the antient Greeks uſed to count from their OLYMPIADS; which were the Space of Four Years, from whence they obſerved any notable Occurrence, and took their Original from thoſe famous Games celebrated every fifth Year in ELIS, and came in Uſe about 500 Years after the Deſtruction of TROY, and in the Year of the World 3248. Before the Inſtitution of theſe Olympiads, the Grecian Hiſtory is generally Fabulous.

Of the Roman Calends, *&c.*

THE antient Romans divided their months into Calends, Nones, and Ides, which way is ſtill uſed by many, writing in Latin: To underſtand it obſerve, 1. That the Calends were the firſt day of the month; the next were the Nones, being 6 in March, May, July, and October, and fell on the 7th day of theſe months, but in all other months were but 4, and happen'd on the 5th day; the Ides were laſt, 8 in every month, being on the 15th of the 4 before-mention'd months, but on the 13th of all the reſt.

2. Note, That they reckon'd all theſe backward, as Calendis Maii, is the Firſt of May; but Pridie Calend. Maii, the day before the Calends of May, is the 30th of April; III. Calend. Maii, April the 29th, and ſo down to XVIII. Cal. Maii, which is April the 14th. Then began the Ides, as Idibus Aprilis, the 13th of April; Prid. Id. Apr. the 12th of April; III. Id. Apr. the 11th of April; and ſo on to VIII. Id. Apr. which is April the 6th. Then were the Nones, as Nonis

Aprilis, the 15th of April; Pridie Nonarum, April the 4th; III. Non. Apr. the 3d of April; IV. Non. Apr. the 2d; and their Cal. Apr. the firſt of April. Thus to go on with May; the 2d of May is VI. Nonarum, (becauſe, as I ſaid before, that was one of the months that had 6 of them) the 3d day is V. Non. the 7th day Nonis Maii; the 8th day VIII. Id. Maii; the 15th the Ides of May; but the 16th ſhall be XVII. Calend. Junii; the 17th of May, XVI. Calend. Junii, and ſo on; all which the Antients, for the help of memory, expreſſed in the following Verſe:

Prima dies menſis cujuſque eſt dicta Calendæ,
Sex Nonas Maius, Octobris, Julius, & Mars;
Quatuor at reliqui, dabit Idus quilibet Octo,
Inde dies reliquos omnes dic eſſe Calendas,
Quos retro numerans dices a menſe ſequente.

English'd thus;

The Roman month its ſeveral days divides,
By reckoning backwards Calends, Nones, and Ides;
Eight Ides hath each, and but four Nones, they ſay,
Yet ſix have March, October, July, May;
After theſe, Nones, and Ides, the reſt of all
The days you muſt the next month's Calends call.

From theſe Calends comes our common word Calendar.

Of the Epact.

THE Epact is uſed for a Number whereby we note the Exceſs of the common Solar Year above the Lunar, and thereby it enables us to find out the Age of the Moon every Year; for the Solar Year conſiſting of 365 days, and the Lunar Year but of 354, the Lunations every Year get 11 days before the Solar Year: But thereby in 19 Years the Moon completes twenty times 12 Lunations, or gets up one whole Solar Year; and having finiſhed that Circuit, begins again with the Sun, and ſo from 19 Years to 19 Years. For the firſt Year afterwards, the Moon will go before the Sun but 11 days; the 2d Year 22 days, which is call'd the Epact of that Year; the 3d Year 33 days; but 30 being an entire Lunation, caſt that away, and count that Year's Epact only 3; the next Year 14, and ſo on, adding yearly 11 days, and caſting away 30, when the number amounts to more.

Example. This preſent Year 1729, Epact is 11.

A Table of Æquation *of* Natural Days.

	Jan.		Feb.		Mar.		April		May		June	
	m.	ſ.	m.	ſ.	m.	ſ.	m.	ſ.	m.	ſ.	m.	ſ.
1	9	0	14	49	10	8	0	49	4	9	1	5
2	9	22	14	48	9	51	0	32	4	11	0	53
3	9 Clock	44	14 Gains.	46	9 G.	34	0 G.	16	4 L.	12	0 L.	40
4	10	6	14	43	9	17	0	1	4	13	0	28
5	10	27	14	39	8	59	0	24	4	12	0	16
6	10	46	14	34	8	42	0	29	4	11	0	3
7	11	5	14	29	8	24	0	44	4	10	0	10
8	11 Gains.	24	14 G.	24	8 G.	5	0 *Loſes.	58	4 L.	8	0 *Gains.	23
9	11	41	14	17	7	47	1	12	4	6	0	36
10	11	58	[illegible]	10	7	29	1	26	4	4	0	49
11	12	15	[illegible]	2	7	10	1	38	4	1	1	1
12	12	31	13	53	6	52	1	51	3	57	1	14
13	12 Gains.	45	13 G.	44	6 G.	33	2 L.	3	3 L.	52	1 G.	27
14	12	59	13	35	6	15	2	14	3	47	1	40
15	13	12	13	24	5	56	2	24	3	41	1	53
16	13	25	13	13	5	37	2	35	3	35	2	5
17	13	35	13	2	5	18	2	46	3	29	2	17
18	13 Gains.	46	12 G.	50	5 G.	0	2 L.	56	3 L.	23	2 G.	29
19	13	57	12	37	4	41	3	4	3	15	2	41
20	14	6	12	25	4	22	2	12	3	7	2	53
21	14	14	12	12	4	3	3	20	2	58	3	4
22	14	21	11	57	3	44	3	28	2	50	3	16
23	14 Gains.	28	11 G.	43	3 G.	26	3 L.	35	2 L.	41	3 G.	27
24	14	33	11	28	3	8	3	42	2	31	3	38
25	14	28	11	13	2	49	3	47	2	21	3	48
26	14	42	10	58	2	31	3	52	2	11	3	59
27	14	45	10	42	2	13	3	56	2	1	4	9
28	14 Gains.	48	10	25	1 G.	55	4 L.	0	1 L.	51	4 G.	18
29	14	49			1	38	4	3	1	40	4	27
30	14	50			1	22	4	6	1	28	4	35
31	14	50			1	5			1	17		

The Æquation *Table continued.*

	July			Aug.			Sept.			Oct.			Nov.			Dec.		
	m.		ſ.	m.		ſ.	m.		ſ.	m.		ſ.	m.		ſ.	m.		ſ.
1	4		43	4		30	3		48	13		14	15		23	5		42
2	4		51	4		20	4		9	13		28	15		15	5		13
3	4	Clock	58	4	G.	10	4	L.	29	13	L.	42	15	L.	5	4	L.	45
4	5		5	4		0	4		50	13		55	14		55	4		16
5	5		11	3		40	4		10	14		8	14		45	3		47
6	5		17	3		37	5		31	14		20	14		33	3		17
7	5		23	3		24	5		51	14		31	14		29	2		47
8	5	Gains.	28	3	G.	11	6	L.	12	14	L.	41	14	L.	6	2	L.	17
9	5		32	2		58	6		33	14		51	13		52	1		48
10	5		35	2		44	6		53	15		1	13		28	1		18
11	5		38	2		30	7		14	15		11	13		21	0		43
12	5		41	2		16	7		34	15		20	13		4	0	*	18
13	5	G.	43	2	G.	2	7	L.	54	15	L.	26	12	L.	47	0	G.	12
14	5		45	1		46	8		14	15		32	12		28	0		42
15	5		46	1		30	8		33	15		38	12		9	1		12
16	5		46	1		13	8		53	15		44	11		50	1		41
17	5		45	0		56	9		13	15		49	11		30	2		10
18	5	G.	44	0	G.	39	9	L.	32	15	L.	52	11	L.	9	2	G.	39
19	5		42	0		21	9		52	15		55	10		47	3		8
20	5		40	0		3	10		11	15		56	10		25	3		37
21	5		38	0		14	10		30	15		58	10		2	4		5
22	5		35	0	*	31	10		48	15		59	9		38	4		32
23	5	G.	31	0	Loſes.	50	11	L.	6	16	L.	0	9	L.	14	5	G.	0
24	5		27	1		9	11		24	15		59	8		49	5		27
25	5		22	1		20	11		42	15		57	8		23	5		55
26	5		16	1		49	11		50	15		55	7		57	6		21
27	5		10	2		7	12		14	15		52	7		31	6		48
28	5	G.	3	2	L.	27	12	L.	29	15	L.	48	7	L.	5	7		14
29	4		56	2		47	12		45	15		43	6		38	7		39
30	4		48	3		8	13		0	15		37	6		10	8		4
31	4		39	3		28				15		31				8		27

A
CHRONOLOGICAL DISCOURSE,

CONTAINING

The various different ACCOUNTS in the Diviſion
of *TIME*, and the *PARTS* of *TIME*.

I. *Of the* Æpoch's *and* Æra's, *and eſpecially of the* Æra *or Year of* Chriſt; *the* Æra *of the* Olympiads; *and the* Æra *of the Building of* Rome: *The Method to find* Eaſter-Day *according to the Rule preſcribed by the Council of* Nice, (*which is ſtill followed by our Church*) *by help of the Golden Number affixed to the Calendar: Alſo the* Roman *Method of dating or denoting the Days of the Month.*

II. *Of the ſeveral Characters of* Time *in general, and particularly of the* Cycle *of the* Moon *and the* Epact.

III. *Of the* Cycle *of the* Sunday Letter, *commonly call'd the* Cycle *of the* Sun.

IV. *Of the* Roman Indiction *and* Julian Period.

According to the late Ingenious Dr. *WELLS*;
Whoſe Method, as to the Hiſtorical Part, is obſerved
in this ſucceeding Treatiſe of *Chronology*.

BATH, Printed by B. LYONS, for the AUTHOR,
M.DCC.XXX.

CHRONOLOGY, or Account of TIME,

COnſiſts in the Explication of the ſeveral Parts of Time, into which it is generally divided, and of the ſeveral Characters by which particular Times are diſtinguiſhed one from another; as, Minutes, Hours, Days, Weeks, Months, Years.

And firſt of a DAY, becauſe from it ariſe the other Parts of Time, conſidered as they are applied to common Uſe; for as Hours and Minutes ariſe from a Day by diviſion and ſubdiviſion, ſo Weeks, Months, and Years ariſe from a Day by collection, or accounting ſuch and ſuch a number of Days together.

By a Day then, according to the primary Intention of the name, is denoted the Time of Light, as in Gen. i. 5. GOD called the light Day, and the darkneſs he called Night: And in this ſenſe 'tis oppoſed to Night, or the time of Darkneſs. And the Sun being made to rule the Day, as in Gen. i. 16. GOD made two great Lights, the greater Light to rule the Day, &c. hence a Day, according to the firſt Intention of the name, ſeems moſt properly and naturally to be determined by the Sun's riſing and ſetting; and alſo to be properly and naturally defined the ſtay of the Sun above the Horizon, or the time between the Sun's riſing and ſetting; agreeable thereunto, Night is the ſtay of the Sun below the Horizon, or the time between the Sun's riſing and ſetting.

But the word Day in another ſenſe is frequently taken to comprehend the Night alſo, and to denote a whole revolution of the Sun round the Earth; and may be reckon'd either from Sun-ſetting to Sun-ſetting, as the Jews, and Athenians did, and as the Italians ſtill do; or from Sun-riſing to Sun-riſing, as did the Babylonians; or from Mid-day to Mid-day, as do the generality of Aſtronomers, and likewiſe the Arabians; or from Mid-night to Mid-night, as did the old Egyptians, and we of this Iſland, together with the French, Germans, and ſome other Europeans, ſtill do. But the twofold acceptation of the word Day, is diſtinguiſhed uſually by the names of a Natural and Artificial Day: Yet ſome call that a Natural, which others call an Artificial Day.

The next Part of Time is call'd an HOUR; And hereby is principally denoted the 24th part of a Day, being the ſpace of an entire revolution of the Sun about the Earth, during which time the Equator makes alſo an entire revolution; tho' in ſtrictneſs the Equator makes ſomewhat more than one revolution in a day, (viz.) ſo much more as anſwers to the Sun's apparent proper motion in the Ecliptic during this ſpace of time, which overplus being various, (viz.) 57 min. in the Sun's Apogee, and 61 min. in its Perigee, hence Aſtronomers take a mean between the 2 numbers for a ſtanding meaſure thro' the whole Year, and ſo compute that to every day there anſwers 59 deg. 8 min. and almoſt 20 3ds over and above 360 deg. of the Equator. Now the difference between the Sun's Revolution and the Equator's, when at greateſt, being but 61 min. or little more than a degree, which anſwers to but little more than a minute in time, it may be paſſed over unregarded in common uſe, and the Hour may be well enough eſteem'd to anſwer juſt to 15 deg. of the Equator; and becauſe theſe Hours are all thus uſually meaſured by 15 deg. of the Equator, they are all look'd on as equal to one another at all times.

But the Jews, Greeks, and Romans did antiently divide a Revolution into 24 equal Hours, but the Day, whether longer or ſhorter, into 12 Hours, and likewiſe the Night: Whence 'tis plain, that their hours were unequal one to another, except only at the 2 Equinoxes, when the day and night being equal, their hours would likewiſe be equal, and the ſame in extent with our hours, tho' not as to denomination.

Hence the equal hours uſed by us are ſometimes call'd Equinoxial hours, and the unequal hours uſed by the Jews are call'd Temporary hours, from their varying in their length according to the ſeaſon of the year; for they always reckoning their firſt hour of the day from the Sun's riſing, which at the Equinoxes anſwers exactly to our 6 o' clock in the morning, it follows that their firſt hour of the day muſt anſwer at the Equinoxes to our 7 o' clock in the morning, and conſequently their third hour to our 9 o'clock in the morning, their ſixth to our 12 o' clock at noon, their ninth to our 3 o'clock in the afternoon, &c.

Upon the like account it is that the Jews divided the night not only into 12 hours, as aforeſaid, but alſo into 4 quarters, call'd watches, each watch containing 3 of their night hours: Theſe watches were diſtinguiſh'd either by their numeral order; whence we expreſly read in the Sacred Hiſtory of the ſecond, third, and fourth watch, as in Luke xii. 38. Mat. xiv. 25. or by ſome other denomination: Thus the firſt watch is otherwiſe ſtiled the head or begining of the watches, as Lam. ii. 19. the ſecond the middle watch, becauſe it laſted 'til midnight, Judg. vii. 19. and the fourth the morning watch, Exod. iv. 24. Again, the firſt was termed the evening, Mar. xiii. 35. the ſecond midnight, the third cock-crowing, the fourth the dawning.

The common diviſion of an hour is into quarters; but Aſtronomers, who are more accurate in accounting time, divide it into 60 parts call'd minutes, and a minute into 60 parts call'd ſeconds, as being minutes of minutes, and ſo ſecondary minutes: And note, that a minute is to be taken in a double ſenſe, either to denote the 60th part of an hour, or elſe to denote the 60th part of a degree. Which therefore may be diſtinguiſhed by the name of a graduary minute; and this graduary minute is ſubdivided by Aſtronomers into 60 ſeconds, and each ſecond into 60 thirds, and each third into 60 fourths, &c. Whereas it is uſual to ſubdivide an horary minute only into ſeconds. Now as 15 deg. of the Equator anſwer to one hour, or 60 horary minutes, ſo one degree of the Equator, or 60 graduary minutes anſwers to 4 horary minutes; and ſo one horary minute to 15 graduary minutes; and which ariſe from a day by diviſion and ſubdiviſion.

Of the ſeveral Parts of Time which ariſe from a Day, *viz.* Weeks, Months, *and* Years.

I. Of a WEEK: Not only denoting the ſmalleſt collection of days, namely, no more than ſeven, but alſo as being the moſt antient collection, as we learn from the Sacred Hiſtory, where we are taught that it was inſtituted preſently after the Creation, in memory of GOD's creating the world in ſix days, and reſting on the ſeventh day from all his works which he had made.

Hence the week or ſeven days came to be diſtinguiſhed in their order by the Latin names of Dies Saturni, Solis, Lunæ, Martis, Mercurii, Jovis, and Veneris; and ſo among us by the names of Saturday, Sunday, Monday, Tueſday, Wedneſday, Thurſday, and Friday; for as Saturday, Sunday, and Monday plainly denotes the day of Saturn, the Sun, and the Moon, ſo Tueſday, Wedneſday, Thurſday, and Friday denote the day of Tuiſco, Woden, Thor, and Friga, which are the Saxon names reſpectively anſwering to Mars, Mercury, Jupiter, and Venus.

It is alſo to be noted, that the antient Chriſtians eſteem'd Eaſter-Week the firſt or principal week in the year, and each day thereof was a Feria or Holiday; ſo that from hence the ſeveral days of the week were diſtinguiſhed in their reſpective order by the names of firſt, ſecond, &c. otherwiſe ſtiled by them the Lord's day, as being the day of our Lord's Reſurrection.

II. The next ſort of Time to be ſpoken of is a MONTH: Which as they are of various ſorts, ſo are called by this one common name, not by chance or without reaſon, but becauſe of their all agreeing in ſome relation to a month, which was primarily ſo called, and does literally import, the time from one New Moon to another, and ſo does properly denote a ſynodical month; and foraſmuch as this ſort of month is moſt diſtinguiſhable by our ſenſe, and ſo moſt obvious and proper to be uſed as a meaſure of time in the common affairs of life, hence it is more than probable, that as our word Month is evidently derived from the word Moon, ſo it was primarily intended to denote likewiſe the time from one New Moon to another, or a ſynodical month.

Of the PERIODICAL MONTH, or the Time wherein the Moon goes round her Orbit: Which, according to obſervation, conſiſts of 27 days and 7 hours 3 qrs; and the Synodical Month of 29 days 12 hours 3 qrs, being the time from one ſynod or conjunction of the Sun and Moon to another:

But the Periodical Month is a period or ſingle revolution of the Moon round the earth, from any one point of the Zodiack to the ſame again.

It is to be further noted, that becauſe during a Periodical or Synodical month of the Moon the Sun paſſes well nigh thro' a whole Sign of the Ecliptic, hence the time of the Sun's paſſing quite thro' a Sign call'd a Solar Month, as nearly anſwering to the ſpace of a Lunar Month, is a little above 29 days and a half; and the fore-mention'd Solar Month is almoſt 30 days and a half; ſo the difference is but ſmall, viz. but about one day.

But becauſe the foremention'd Solar and Lunar Months do not conſiſt juſt of whole days, but of ſome odd hours and minutes over, which cannot be conſider'd in the common account of time, therefore ſome certain number of juſt whole days are made uſe of inſtead of the fore-mention'd Aſtronomical Months, but however are call'd likewiſe Months; foraſmuch as they come as near as can be to the ſaid Aſtronomical Months, from which they are diſtinguiſhed by the name of Civil Months, as being adapted to civil or common uſe.

Thus in the firſt place, what is moſt commonly call'd a Month among us, is made to conſiſt of juſt 28 days, and ſo of juſt four whole weeks; whence it is peculiarly ſtiled the Month of Weeks: It is obvious, that in order to render the computation of time from weeks to months more eaſy, and ſo more fit for common uſe, it was neceſſary that the month ſhould conſiſt juſt of ſome certain number of whole weeks; which being thus neceſſary, four whole weeks were made choice of for the number, which ſhould conſtitute the month, becauſe this comes nearer than any other number of weeks to the ſeveral Aſtronomical months before-mention'd.

The Aſtronomical Synodical Month is adapted to civil or common uſe, by making the Civil Synodical Month to conſiſt alternately of 29 and 30 whole days; for 29 more 30, equal 59, equal 1 half, leſs 2; that is, two Civil Synodical Months are equal to two Aſtronomical Synodical Months, omitting in both the odd minutes; and conſequently, according to this method, the New Moon will keep to the firſt day of every ſuch Civil month for a long time together, when once adjuſted thereto. This was the month in civil or common uſe among the Jews, Greeks, and Romans, 'til the time of Julius Cæſar, and is ſtill ſo among the Turks.

In like manner the Aſtronomical Solar Month may be adapted to common uſe, by making the Civil Solar Months to conſiſt alternately of 30 and 31 days, excepting one month of the twelve, which ſhould conſiſt of 30 days every four years, the other three years it muſt conſiſt of only 29 days, as by the adjoining Scheme or Table of the Solar Months.

Months.	Days.	Months.	Days.	Months.	Days.
March	31	Quintilis	31	November	31
April	30	Sextilis	30	December	30
May	31	September	31	January	30
June	30	October	30	February	29

And every 4th year 30.

For according to this regular uniform method, there will be 365 days in the 12 Solar months for 3 years together, and every 4th year 366 days, juſt as it is now. It is evident then, that the Civil Solar months might be thus uniformly conſtituted; and indeed they were ſo conſtituted in the main at firſt by Julius Cæſar, who brought the Solar months into common uſe among the Romans; whereas they uſed before the Civil Lunar month, (as was before obſerved) the alteration was made afterwards, when as the fifth month, which had afore been call'd from its rank Quintilis, was now named Julius, in honour of the Emperor of that name; ſo the ſixth month, which had afore been call'd from its rank Sextilis, was now named Auguſtus, in memory likewiſe of the Emperor of that name; and not only ſo, but whereas this month conſiſted afore but of 30 days, and ſo was a day ſhorter than the foregoing month of July, there was a day more added to it, that ſo the honour paid to Auguſtus might not ſeem to fall ſhort of the honour paid to Julius, even in this punctilio. Now this alteration being made as to the month of Auguſt, it (according to the alternate method at firſt inſtituted, and ſtill preſerved in the following months) made an alteration in all the following months except January, which upon this alteration ſhould have had but 30 days, according to the method primarily inſtituted. But this month being ſo named of Janus, eſteemed by the Romans the God of Time, on the like conſideration that it ſeemed proper to lengthen the month of Auguſt by a day, it was thought not proper to leſſen the month of January by a day; but rather to continue it ſtill 31 days long, and to make February, which afore was 29, and every fourth year 30 days long, to be commonly but 28, and every fourth year but 29 days long: And ſo the Solar months came to ſtand as they do now in our Calendar, whence they are call'd Calendar months, in reference to the names and number of days aſſigned to each, ſet down in ſhort in the following Table.

Months.	Days.	Months.	Days.	Months.	Days.
March	31	July	31	November	30
April	30	Auguſt	31	December	31
May	31	Septemb.	30	January	31
June	30	October	31	February	28

But every 4th year 29.

So that by comparing this with the foregoing Table, will be illuſtrated whatever has been here ſaid either concerning the firſt Inſtitution of the Solar months among the Romans by Julius Cæſar, or concerning the changes that have been ſince introduced; and alſo it will appear that the whole number of days contained in the 12 Solar months taken together, hath been all along the ſame, viz. 365 days, and every fourth year 366; the former of which ſum is the time wherein the Sun ſeems to paſs thro' the 12 Signs, omitting the odd hours and minutes; and the latter ſum is the time wherein the Sun ſeems to paſs thro' the 12 Signs, adding thereto the

the odd hours and minutes which were omitted the 3 foregoing years, and ſo many minutes more as make the ſaid odd hours and minutes equal to a whole day in 4 years. Now as theſe 12 Solar or Calendar Months make up the Civil Solar Year now in uſe among us, in which ſenſe it is that a twelve-month is uſed by us as an equivalent term to a year; ſo what has been ſaid concerning the ſums of 365 and 366 days being contain'd in the 12 Calendar months taken together, will be more particularly explain'd when we come preſently to ſpeak of the Civil Year in uſe among us, after we have made ſome ſhort obſervations concerning a Year in general.

III. By a YEAR, the only part of Time remaining to be treated of, is denoted in general, a revolution of a celeſtial Light round the Heavens, by (what is eſteem'd) its proper motion. But by a Year in general is principally and properly denoted, the Time wherein the Sun appears to move round the Ecliptic, which is 365 days 5 hours and very near 49 minutes and a half. Now becauſe during the time of one Solar Year there are 12 Synodical Months, hence 12 Synodical Months conſtitute (what is call'd) a Lunar Year; which therefore conſiſts of 354 days 8 hours and a little more than 48 minutes: ſo that the exact difference between the Aſtronomical Solar and Lunar Year is 10 days 21 hours and 1 minute.

But whereas the hours and minutes above the whole days of a Solar Year can't be taken notice of in civil or common uſe, therefore the Civil Solar Year among us is made to conſiſt only of 365 days for 3 years together, and every fourth year of 366 days; namely, whereas in an Aſtronomical Solar Year there are above the whole days 5 hours and very near 49 min. and a half, there are added every year about 11 min, to make up this juſt 6 hours, and theſe 6 hours amount juſt to a whole day in 4 years.

Each of the 3 years conſiſting only of 365 days is call'd a common year, and every 4th year conſiſting of 366 days is call'd a Biſſextile or Leap-year; the reaſon of its being call'd Biſſextile is, becauſe the day ariſing in 4 years out of the 6 hours aforemention'd is this year intercalated, i. e. inſerted into the Calendar, by reckoning according to the Roman way, Bis ſextum Cal. Martii, i. e. by reckoning twice the 6th day before the Calends of March, which anſwers to our 24th of February: But altho' we took our Civil Solar Year from the Romans, yet we do not imitate them in this particular; for inſtead of reckoning Feb. the 24th twice, we reckon this year 29 days in February, whereas in common years we reckon but 28; and tho' we reckon not Feb. 24th twice, yet we reckon twice the Calendar Letter always belonging to Feb. 24th, namely, F; and by this means that which was the Sunday Letter from Jan. 1ſt. to Feb. 24th, will be ſo no longer, but the Letter next before it in the order of the Alphabet will be the Sunday Letter for the remaining part of the year: From which leap or change from one Sunday Letter to another, this year came to have the name of Leap-year among us.

It has been before obſerved, that the Aſtronomical or true Solar Year conſiſts of 365 days 5 hours 49 min. and a half; whereas to adapt it to civil uſe the Solar Year is conceived to conſiſt of 365 days and juſt 6 hours, (which 6 hours in 4 years make up juſt another whole day) ſo that the civil Solar Year is about 11 min. longer than the true Solar Year; hence it comes to paſs that the Seaſons, or (which comes to the ſame) the Equinoxes and Solſtices depending on the true Solar Year, do not keep always to the ſame time or part of our civil or common year, but vary every year about 11 min. viz. 10 m. 48 ſec. and conſequently about a whole day in 133 years; wherefore from Anno Dom. 325, when the famous Council of Nice was held, to A. D. 1582, wherein Pope Gregory XIII. reform'd the Calendar, there was found to have aroſe a variation of 10 days; the Vernal Equinox, which at the time of the Nicene Council fell about the 21ſt of March, in A. D. 1582 being found to fall on March 11th, hereupon the ſaid Pope, intending to bring back the Equinox to the time of the year it fell upon at the time of the Nicene Council, order'd Octob. the 5th (in the year 1582) to be reckon'd Octob. 15th, thereby ſuppreſſing 10 days, and making the following March 11th to be reckon'd March 21ſt, and ſo the Vernal Equinox, which otherwiſe would have been reckon'd to fall on March 11, to fall on March 21, as at the time of the Nicene Council; and that the like variation might not happen again, the ſaid Pope order'd that once in 133 years a day ſhould be taken out of the Calendar, or (which comes to the ſame) that 3 days ſhould be taken out every 400 years, after this method, viz. whereas according to the Account before (and ſtill by us) uſed, every 100th year ſhould be a Leap-year, and the other 100 years ſhould be common years.

As the Account before in uſe is thence call'd the Old Stile, as alſo the Julian Account or Julian Year, from Julius Cæſar, by whoſe authority it was firſt introduced among the Romans 46 years before Chriſt, according to the common account by the years of our Lord; ſo this form of the Civil Solar Year, introduced by the foremention'd Pope Gregory, is from him call'd the Gregorian Account, as alſo from its being, comparatively with the former, newly introduced, the New Stile; and this is uſed in Italy, France, Spain, and where-ever the Pope's Authority is acknowledged; and as it had been received from the firſt by the Popiſh Countries of Germany, ſo toward the end of the laſt Century it was received alſo by many of the Reform'd People of Germany, as to their civil or common Account of time; for as to their Eccleſiaſtical Account, or finding the Eaſter Moon or Time of Eaſter, theſe follow the Rudolphine Tables of Kepler: The Old Stile is ſtill uſed by us of this Iſland, and Ireland, and ſome others; altho' the Calends or 1ſt of January is now adays almoſt thro' all Europe commonly look'd upon as the Begining of the Year, whether Julian or Gregorian; yet there are ſome who reckon the Begining of it from ſome other part of the year; thus the Venetians, Florentines, &c. in Italy, the Inhabitants of Triers in Germany, reckon the Begining of the Year from the

Vernal Equinox; the Church of England, in conformity to the antient uſage of the Chriſtian Church, reckons her Eccleſiaſtical Year from the feaſt of the Annunciation, call'd by us Lady-day; and our Civil Year, according to our Law, takes alſo its beginning from the ſame day; tho' the common people and others among us, in matters not requiring the nicety of a legal date, reckon the beginning of the year from the 1ſt of January.

It has been obſerved before, that the Lunar Year, according to Aſtronomical exactneſs, conſiſts of 354 days 8 hours and a little more than 48 min. but to adapt this alſo to Civil uſe, the Civil Lunar Year is eſteemed to conſiſt only of 354 whole days, and the Civil Solar Year of 365 days; the difference is 11 days, the former being ſo much ſhorter than the latter; hence it comes to paſs, that ſuch as uſe the Civil Lunar Year without any regard to the aforeſaid difference, their year, ſuppoſing it to begin now in Spring, will after 8 years time begin in Winter, and after 8 years more in Autumn, and ſo after that in Summer, and laſtly, after about 33 years in all will begin in Spring again. Hence it is call'd Annus Lunaris Vagus, or the Wandering Lunar Year, becauſe its beginning thus wanders thro' the ſeveral Seaſons, and that in the memory of man; and this is the ſort of year uſed by the Turks.

Of the Cycle *of the* Moon *and* Epacts.

The Cycle of the Moon is to be eſteemed a natural character of time, becauſe it depends on a natural cauſe, viz. the Motion of the Moon, which is ſuch that after 19 years, very nearly, the New Moons and Full Moons are obſerved to fall on the ſame day of the Julian year as they did 19 years before; hence this Cycle is otherwiſe termed the Cycle of 19 years.

The New Moons being obſerved to fall out thus, they were wont formerly to calculate or find out the time of the New Moons (without the help of Aſtronomical Tables) after this manner: They obſerved on what day of each Calendar month the New Moon fell in each year of this Cycle, and to the ſaid days they ſet reſpectively the number of the ſaid year, thus, obſerving that the New Moons in the firſt year of this Cycle fell on Jan. 23. Feb. 21. March 23. &c. they ſet the number 1. to the ſaid days, and in like manner obſerving that in the ſecond year of this Cycle the New Moons fell on Jan. 12. Feb. 12. March 12. &c. to the ſaid days they ſet the number 2. and after this method they went thro' all the 19 years of this Cycle, as may be ſeen in the Calendar at the end of this Treatiſe; the numbers thus ſet to the days whereon the New Moons fell in each year are call'd the Golden Numbers, either becauſe they were formerly wont to be writ in gold, or elſe becauſe of their golden or great uſe; it is alſo call'd the Prime, becauſe the ſaid numbers were placed in the prime or firſt column of the Calendar in our Common Prayer Book, and in the Calendar annex'd,

becauſe

becauſe each Golden Number denotes Luna Prima, or the firſt day of the New Moon, according to which way of ſpeaking the Full Moon is frequently ſtiled Luna Quartadecima, as falling on the 14th day after the New Moon incluſively. The Golden Numbers being thus placed, it was eaſy to find what day of any month in any year given the New Moon would fall upon, it being known to what year of the Moon's Cycle the year given anſwer'd; thus ſuppoſe A. D. 354. to be the year given, which anſwers to the 13th year of the Moon's Cycle, and ſuppoſe it to be inquired, what day of March the New Moon fell upon that year; I look for the numb. 13. in the month of March, and find it ſet to the 11th day, whereby is ſhewn that the New Moon fell that year on that day of March.

And by this method the New Moons could be found with accuracy enough at the time of the Nicene Council, becauſe the Golden Number did then ſhew the day of the year on which the New Moon fell out; and hereupon is founded the rule of the Nicene Council for finding Eaſter; of which more hereafter.

It is here to be obſerved, that the Golden Numbers do not now ſhew the days whereon the New Moons fall, for the Cycle of the Moon is leſs than 19 Julian years by 1 hour 27 min. and almoſt 32 ſeconds; whence it comes to paſs, that altho' the New Moons fall again upon the ſame days as they did 19 years before; yet they fall not on the ſame hour of the day, but 1 hour 27 min. and almoſt 32 ſec. ſooner; and this difference ariſing in about 312 years to a whole day, hence the New Moons after every 312 years fall a whole day ſooner. Upon this ſcore the New Moons fall now four days ſooner than they did at the time of the Nicene Council, which being obſerved, the day, tho' not the hour of it, on which the New Moons fall may be now found by the Golden Number; for Inſtance, I would know on what day of March the New Moon will fall in the year 1729. By the rule following it will be found to be the firſt year of the Moon's Cycle: I look therefore for the Golden Number 1. and find it in the Calendar oppoſite the 23d day of March; then counting four days back from thence, it will fall on the 19th day, which is the day of the New Moon in March 1729.

To find what Year of the Moon's Cycle anſwers to any given Year of Chriſt.

This is done by adding 1 to the given Year of Chriſt, and then dividing the ſum by 19, the remainder, if any, is the Year of the Moon's Cycle; if nothing remains, then it is the 19th or laſt year of the Moon's Cycle: The reaſon of adding 1. is, becauſe the Æra of Chriſt began in the ſecond year of the Moon's Cycle, as is ſhewn in the firſt part of this Book.

The Epacts *of the* Moon.

It has been before obſerved, that the Civil Lunar Year is 11 days ſhorter than the Civil Solar Year, conſequently two ſuch Lunar Years will be 22 days ſhorter than two ſuch Solar Years, and three Lunar Years will be ſhorter than three Solar Years by 33 days. Now ſuch as uſe the fixed Lunar, otherwiſe call'd the Luniſolar Year, in order to adjuſt the ſaid Lunar Year to the Solar, as often as the Lunar Year does thus come to be 33 days ſhorter than the Solar, do intercalate a month of 30 days into the Lunar Year, except only every 19th year, viz the laſt year of the Moon's Cycle, when the intercalated month conſiſts but of 29 days.

G. N.	Epact
1	XI
2	XXII
3	III
4	XIV
5	XXIV
6	VI
7	XVII
8	XVIII
9	IX
10	XX
11	I
12	XII
13	XXIII
14	V
15	XV
16	XXVI
17	VII
18	XVIII
19	XXIX

By this means the Civil, Lunar, and Solar Years are kept ſo adjuſted together, as that the firſt year of the Moon's Cycle comes not ſhorter of the Solar year than 11 days; the ſecond year of the ſaid Cycle not ſhorter than 22 days; the third year ſhorter only by 3 days, &c. as may be ſeen in the adjoining Table; namely, as the New Moons are the ſame, i. e. fall on the ſame day every 19 years, ſo the difference between the Lunar and Solar Year is the ſame every 19 years; and becauſe the ſaid difference is always to be added to the Lunar Year, in order to adjuſt or make it equal to the Solar Year, hence the ſaid difference reſpectively belonging to each year of the Moon's Cycle is call'd the Epact of the ſaid year, i. e. the number to be added to the ſaid year to make it equal to the Solar year.

Upon the mutual reſpect between the Cycle of the Moon and the Cycle of the Epacts, there is founded this rule for finding the Epact belonging to any year of the Moon's Cycle: Multiply the year of the Moon's Cycle by 11, the product, if leſs than 30, is the Epact ſought, but if greater than 30, divide it by 30, and the remainder of the dividend is the Epact.

For Example. I would know the Epact the year 1729; which has been already found to be the firſt year of the Moon's Cycle, which ſhould be multiplied by 11, but ſeeing 1 doth neither multiply nor divide, therefore the Epact is 11; namely, in reſpect of the Julian Account; for in reſpect of the Gregorian Account, there is a different method, the Epact being different: However, the Julian Epact being known, it is eaſy thence to know the Gregorian Epact, namely, if the Julian Epact be greater than 11, ſubſtract 11 from it, if leſs, add 30 to it, and out of the ſum ſubſtract 11, and the reſidue will be the Gregorian Epact.

It remains only to obſerve, that the Epacts of the Moon are juſtly to be eſteemed as natural characters of time, foraſmuch as they depend on a natural cauſe, viz. the Motion of the Moon; for the reaſon why the Civil Lunar Year is leſs than the Civil Solar (i. e. Julian) Year by 11 days, is, becauſe as the Moon goes round her Orbit there are 12 conjunctions of her and the Sun, or 12 Synodical months (which makes up a Lunar year) in leſs time by 11 days, very nearly, than the Sun ſeems to go round the Ecliptic; and ſo the reaſon why the Cycle of the Epacts, as well as that of the Moon, conſiſts of 19 years, is, becauſe in that interval of time the Moon's motion has (much) the ſame reſpect to the Sun as it had 19 years before.

Of the Cycle *of the* Sunday Letter, *commonly call'd the* Cycle *of the* Sun.

The Cycle of the Sun is very improperly ſo called, as having no relation to the courſe of the Sun, but to the courſe of the Dominical or Sunday Letter; whence it ought to be called the Cycle of the Sunday Letter: It conſiſts of 28 years, foraſmuch as after every 28 years the courſe or order of the Sunday Letter is the ſame as it was before.

The Uſe of this Cycle ariſes from the cuſtom of aſſigning in the Calendar to each day of the week one of the firſt ſeven Letters of the Alphabet; A being always fix'd to January 1. whatever day of the week it be, B to Jan. 2. C to Jan. 3. and ſo in order G to Jan. 7. after which the ſame Letters are repeated again, A being affix'd to Jan. 8, &c. According to this method, there being 52 weeks in a year, the ſaid 7 Letters are repeated 52 times in the Calendar; and were there but juſt 52 weeks the Letter G would belong to the laſt day of the year, as the Letter A does to the firſt, and conſequently that Letter which was at firſt conſtituted the Sunday Letter (and the ſame is to be underſtood of the other days of the week) would always have been ſo, and there would have been no change of the Sunday Letter: But our year conſiſting of 52 weeks and an odd day over, hence it comes to paſs that the Letter A belongs to the laſt, as well as to the firſt day of every year; for altho' every Leap-year conſiſts of 366 days, and ſo of 2 days over 52 weeks, yet it is not uſual to add a Letter more, viz. B, to the end of the year, but inſtead thereof to repeat the Letter F, which anſwers to Feb. 24, and to affix it again to the intercalated day, (as before obſerved) which we call Feb. 25. by which means the ſaid 7 Letters of the Alphabet remain affix'd to the ſame days of a Leap-year as of a common year thro' all the reſt of the Calendar, both before and after the Letter A, then thus always belonging to the firſt and laſt day of the ſame year, and conſequently to the laſt day of the old year, and firſt day of the new; it thence comes to paſs that there is a change made as to the Sunday Letter in a backward order, that is, ſuppoſing G to be the

Sunday Letter one year, F will be the next, and ſo on: This is illuſtrated by the following Table, where it muſt be obſerved, that the great Letter is the Sunday Letter for each year, as may be ſeen in the Calendar at the end of this Treatiſe.

December 1729.			January 1730.		
E	Sunday	24	D	Monday	1
f	Monday	25	e	Tueſday	2
g	Tueſday	26	f	Wedneſday	3
a	Wedneſday	27	g	Thurſday	4
b	Thurſday	28	a	Friday	5
c	Friday	29	b	Saturday	6
d	Saturday	30	c	Sunday	7
E	Sunday	31	D	Monday	8

Now from the foregoing Table it is evident, how the odd day above 52 weeks in a year makes the Sunday Letter change from one Letter to the next to it in a backward order; ſo that it is obvious, were there but this ſingle change Sunday would be denoted by each of the 7 Letters every 7 years, and ſo the Cycle of the Sunday Letter would conſiſt of no more than 7 years: But now there being in every 4th or Leap-year two days above 52 weeks, hence it comes to paſs that there is every ſuch year a double change made as to the Sunday Letter, namely, as the odd ſingle day above 52 weeks in a common year makes (as is ſhewn in the foregoing Table) the firſt Sunday in January to ſhift from that which was the Sunday Letter of the foregoing year to the next Letter to it in a backward order, ſo the other day intercalated every Leap-year after Feb. 23d. tho' it makes no change as to the days of the month to which the Alphabetical Letters reſpectively belong, which is brought about by the artifice of repeating the Letter F twice, as before obſerved; yet it does make a change as to the days of the week to which each Alphabetical Letter belongs, for the remaining part of the year, as is evident by the following Table, containing the latter part of February 1712, being Leap-year, and the former part of March.

February			March		
23	e	Saturday	1	d	Saturday
24	F	Sunday	2	E	Sunday
25	f	Monday	3	f	Monday
26	g	Tueſday	4	g	Tueſday
27	a	Wedneſday	5	a	Wedneſday
28	b	Thurſday	6	b	Thurſday
29	c	Friday	7	c	Friday

So this Table ſhews how it comes to paſs that after Feb. 23. not F, as before, but E is the Sunday Letter for the reſt of the year, and conſequently as the former Table will ſerve to ſhew how by the odd day in a common year there is made every common year a ſingle change as to the Sunday Letter, ſo the latter Table compared with the former will ſhew how by the intercalated day of a Leap-year there is made after Feb. 23d. in every Leap-year another change of the Sunday Letter, beſides the former made at the begining of the ſaid Leap-year, and conſequently how there comes a double change of the Sunday Letter every Leap-year.

Now as the Cycle of the Sunday Letter would have conſiſted but of 7 years, had there been only a ſingle change of the ſaid Letter every Leap or 4th year, it comes to paſs that the ſaid Cycle conſiſts of 4 times 7 years, i. e. the Sunday Letter does not proceed in the ſame courſe as it did before under 28 years, and after that number of years in courſe or order, is the ſame as it was before: Which is illuſtrated by the following Table; where it is to be obſerved, that the firſt year and every 4th year after the Cycle is a Leap-year, and therefore has two Sunday Letters appertaining to it.

A TABLE of the Cycle *of the* Sun.

1	G F	5	B A	9	D C	13	F E	17	A G	21	C B	25	E D
2	E	6	G	10	B	14	D	18	F	22	A	26	C
3	D	7	F	11	A	15	C	19	E	23	G	27	B
4	C	8	E	12	G	16	B	20	D	24	F	28	A

To find what Year of this Cycle any given Year of our Lord anſwers to, and conſequently what is the Sunday Letter for the Year given, work thus; to the given Year of our Lord add 9, and divide the ſum by 28, (the reaſon of adding 9 is, becauſe the Æra of Chriſt began in the 10th Year of this Cycle;) if any of the dividend remain, the ſaid remainder ſhews the Year of the Cycle ſought, if nothing remains of the dividend, then it it is the laſt or 28th Year of the Cycle: For Inſtance, I would know what Year of the Cycle of the Sun An. Dom. 1729 anſwers to; by the foregoing Rule I find it anſwer to the 2d Year of the ſaid Cycle; for 1729 more 9, equal 1738, and that divided by 28, there remains 2, and by the Table of this Cycle I find the Sunday Letter to be E, being the firſt year after Leap-year.

Now having found the Sunday Letter according to the Julian Account, the Gregorian Sunday Letter will be always the third in a backward order from the Julian, thus E being the Julian Sunday Letter for 1729, if I count in a backward order it falls on B A, which are Sunday Letters in the Gregorian Account for the ſame year.

It may not be altogether unuſeful to obſerve further, that each of the firſt 7 Alphabetical Letters always (as is before obſerved) belonging to the ſame day of each month in the year, according to the following Verſe, which ſhews by the firſt Letter of each word what Letter belongs to the firſt day of each month, the order of the words anſwering to the order of the months, viz.

Jan.	Feb.	March.	April.	May.	June.
At	Dover	Dwells	George	Brown	Eſquire,
July.	Aug.	Sept.	Octob.	Novemb.	Decemb.
Good	Chriſt.	Finch	And	David	Fryar.

Wherefore the Sunday Letter being known, it is eaſie by the help of the foregoing Verſe to tell what day of the week the firſt day of any month falls upon, namely, by conſidering the order or diſtance of the Letter belonging to the firſt day of the given month from the given Sunday Letter. Ex. gr. I would know what day of the week Feb. 1ſt. 1729. will be, when the Sunday Letter is E.

It being known by the foregoing Verſe that D is the Letter that belongs alſo to March 1ſt. it follows that as D is the Letter next before E, ſo March 1ſt. muſt fall on that day of the week which is next before Sunday, viz. Saturday.

It being thus to be known what day of the week the firſt day of any month falls upon, thereby may be eaſily known alſo what day of the week any other day of the ſame month falls upon, viz. by conſidering that the 1ſt. 8th. 15th. 22d. and 29th. day of any month always fall upon the ſame day of the week, and then reckoning how far diſtant the day propoſed is from any of the aforeſaid days: For Inſtance, I would know what day of the week March 18th. falls upon 1729. It being before known that the firſt of March will fall on a Saturday, it follows that March 15th. will likewiſe be on a Saturday, and therefore March 18th. as being 3 days after March 15th. will fall on a Tueſday, being 3 days after Saturday; and thus by the Sunday Letter and the foregoing Verſe may be found what day of the week any day of the year in general will fall upon.

Of the Indiction *and* Julian Period.

THE INDICTION is a Circle or Cycle of 15 years, which has no relation to any celeſtial motion, but was inſtituted wholly on a political or civil account, viz. in reſpect to certain taxes or contributions, which were to be paid every 15 years. When this Cycle was firſt inſtituted is not left upon record; but it is evident from hiſtory, that it has been in uſe ever ſince the time of Conſtantine the Great, or from A. D. 312. It was uſed both by the Greeks and Romans, but after a manner ſomewhat different: The Roman Indiction is ſtill uſed by the Pope in his Bulls, &c.

Note, That the Greek Indiction begins from Septemb. 1ſt. the Roman Indiction from Jan. 1ſt. and the former is uſed in the Acts of Councils, and in the Novels of the Emperors, &c.

The Year of the Roman Indiction anſwering to any given Year of Chriſt is found (as I have before ſhewn in the firſt part of this Book) by adding 3 to the Year of Chriſt, and dividing the ſum by 15, the remainder of the dividend, if any there be, ſhews the Indiction; but if nothing remain, then it is the 15th or laſt Year of the Indiction. The principal reaſon of taking notice of this Cycle here is, becauſe it conduces to the underſtanding of the Julian Period, of which we ſhall ſpeak next.

The JULIAN PERIOD is no other than a greater Circle made up of the three forementíon'd Cycles of the Sun, Moon, and Indiction, multiplied into one another, and ſo conſiſting of 7980 years, for the Cycles of the Sun and Moon, viz. 19 and 28 being multiplied together make 532, which multiplied again by 15, the Cycle of the Indiction makes 7980.

This number of years ariſing from the Cycles of the Sun and Moon being multiplied together, is peculiarly ſtiled the Dionyſian Period, and alſo the Victorian Period, from perſons of the like names, who introduced the uſe thereof.

It is call'd the Julian Period, becauſe it was adapted by the Author or Inventer of it, Joſeph Scaliger, to the Julian Year, and its forementíon'd Cycles. It is of excellent uſe in Chronology, or diſtinguiſhing of Times, becauſe the ſame years of the Cycles of the Sun, Moon, and Indiction, which belong to any one year of this Julian Period, will never fall together again 'til after 7980 years, and conſequently not as long as the world ſtands, according to the opinion probably received concerning the duration of the world. Hence Chronologers endeavour to adjuſt all other Accounts of Time, and conſequently all Tranſactions and Events recorded in hiſtory, to the Julian Period.

Now to find what Year of the Julian Period any given Year of Chriſt anſwers to, work thus; to the given Year of Chriſt add 4713, becauſe ſo many Years of the Julian Period were expired before the firſt Year of Chriſt, and the ſum gives the Year of the Julian Period ſought. I would know what Year of the Julian Period 1729 anſwers to; 1729 more 4713, equal 6442, the Year ſought of the Julian Period, or 6442 leſs 1729, equal 4713, An. Dom. ſought.

If the Year of the Julian Period given be 4713, or leſs than it, then ſubſtract the ſame from 4714, which is the Year of the Julian Period, that anſwers to A. D. 1. or the firſt Year of our Lord, and the reſidue will ſhew how long before the beginning of the common computation from the Nativity of Chriſt the given Year of the Julian Period was.

Examp. The City of Rome is ſaid to have been built Julian Period 3960; I would know therefore how long it was built before Chriſt. Now 4714 leſs 3960, equal 754: Wherefore Rome was built 754 Years before the beginning of the common Æra of Chriſt.

To know what Year of the Cycle of the Sun, Moon, or Indiction anſwers to any given year of the Julian Period, divide the given year reſpectively by 28, or 19, or 15, the remainder of the firſt diviſion will ſhew the year of the Sun's Cycle, the remainder of the ſecond diviſion will ſhew the year of the Moon's Cycle, and of the third diviſion the year of the Indiction: If nothing remain in each diviſion, then it is the laſt year of each Cycle reſpectively.

On the contrary, to know what Year of the Julian Period anſwers to any given Year of the Cycle of the Sun, Moon, or Indiction, multiply the Cycle of the Sun into 4845, the Cycle of the Moon into 4200, the Cycle of the Indiction into 6916, the ſum of the products being divided by 7980, the remainder will ſhew the Year of the Julian Period ſought.

Of the Æra *or* Year *of* Chriſt, *the* Æra *of the* Olympiads, *and the* Æra *of the* Building *of* Rome, *&c.*

THERE are ſeveral Epoch's or Æra's made uſe of both formerly and at preſent, in the ſeveral parts of the world; but that of principal concern to us Chriſtians is the Æra of CHRIST, or the common way of computing Time from the Nativity of Chriſt, according to which this preſent year is reckon'd the 1730th from the Nativity of Chriſt, or rather from Jan. 1ſt. next following the Nativity of Chriſt, according to the common computation generally received in Chriſtendom or Europe. The Æra or way of reckoning from Chriſt was firſt introduced by one Dionyſius, ſurnamed Exiguus, from his little ſtature, ſomewhat more than 500 years after Chriſt: Since which time Chriſtians have reckon'd their years either from the Birth or Incarnation of our Bleſſed Saviour; whereas before they were wont to reckon ſome other ways. According to Dionyſius, the author of the Æra computed from Chriſt, our Lord was conceived on the 8th of the Calends of April, now call'd Lady-day, in the firſt year of this Æra, and was born about the then Winter Solſtice next following, that is, Decemb. 25th. And this Account was at firſt univerſally received among Chriſtians; but is now a-days uſed only in England and Ireland, where not only the Eccleſiaſtical, but alſo the Civil Year is ſtill reckon'd according to Law from the feaſt of the Annunciation or Lady-day, as it was at firſt by Dionyſius himſelf; whereas in other parts of Chriſtendom, (as is before obſerved) and even in England as to common affairs which require not a Legal (Eccleſiaſtical or Civil) date, the Year of Chriſt is reckon'd now a-days not from the Annunciation or Lady-day, but from Jan. 1ſt. next before the Lady-day from which the Legal date of our Eccleſiaſtical or Civil Year begins. It is alſo to be obſerved, that the common account by An. Dom. introduced by the aforeſaid Dionyſius Exiguus, does not agree exactly to the true Year of Chriſt's age; for according thereto, Herod the

Great muſt be dead before our Saviour was born, which is contrary to our Goſpel hiſtory: How much the difference between the true and common Account is, the Learned are not agreed; but I prefer that opinion which makes the common Account too little by 2 years; ſo that whereas this preſent year is commonly eſteem'd An. Dom. 1730, yet it is truly A.D. 1732, or the 1732d year from the Birth of Chriſt, or Jan. 1ſt. next enſuing.

There is alſo another Æra frequently made uſe of by Chriſtian writers, viz. the Æra of the CREATION, which is generally agreed to have been about 4000 years before Chriſt; and becauſe to ſay ſuch or ſuch a thing fell out in ſuch a year of the world, does not give us ſo clear an idea of the diſtance of the ſaid occurrence from us, as it does to ſay that it happen'd in ſuch a year before Chriſt, therefore the computation from the Creation of the world begins to be laid aſide, even in matters relating to the Sacred Hiſtory of the Old Teſtament, and inſtead thereof the occurrences of the Old Teſtament are now a-days computed by their diſtance before Chriſt; thus inſtead of ſaying that the Univerſal Deluge happen'd Anno Mundi, or in the Year of the World 1656, it is thought more inſtructive to ſay that it happen'd 2294 Years before Chriſt, this laſt manner of computation giving us a clearer notion of the Time when the Flood happen'd, in reſpect of its diſtance from us; for we being wont to reckon our Time from Chriſt, and ſo reckoning this preſent year to be the 1730th from Chriſt, when we are told that the Flood was 2294 before Chriſt, we can from thence eaſily gather that the Flood was about 4000 years ago, in reſpect of this preſent Time; and on the ſame conſideration it appears to be much the beſt or eaſieſt and cleareſt way for us to compute likewiſe all occurrences mention'd in any other, as well as the Sacred Hiſtory, by their diſtance either before or after Chriſt, and ſo to make the Nativity of Chriſt the univerſal Head or Epoch of all Chronology, counting therefrom all occurrences either backward or forward.

The moſt antient and renowned Epoch uſed by the Heathens is that of the OLYMPIADS, or OLYMPIC GAMES, which were inſtituted by one Iphitus, in the fields of Olympia, a city or town of the region Elis in the Peloponneſe, and which laſted 5 days, the laſt whereof fell on the Full Moon which was next after the Summer Solſtice. Theſe Games were celebrated every 4 Years, that is, there were 3 Years between the Years wherein the next preceding and the next following Olympiad was celebrated: hence by a complete Olympiad is denoted the ſpace of 4 Years, the Year wherein the Olympiad was celebrated being ſtiled the firſt Year of the ſaid Olympiad, and ſo on. The celebration of the firſt Olympiad is referr'd to the 3938th Year of the Julian Period, and conſequently to the 777th Year before Chriſt, viz. to the Calends of July in the Summer of the ſaid Years.

Any Year of the Olympiads being given to find the correſpondent Year of the Julian Period, work thus; multiply the complete Olympiads by 4, and to the product add the Year (if it be given) of the Olympiad running, and alſo 3937, the ſum is the Year of the Julian Period ſought: For Inſtance, Rome is ſaid to be built, according to Varro's account, in the 4th Year of the 6th Olympiad; wherefore I multiply 5, (the number of the complete Olympiads) by 4, makes 20, and thereto I add 4 more, (the Year given of the Olympiad running, or 6th Olympiad) and alſo 3937, all which together amounts to 3961, the Year ſought of the Julian Period.

Having found the Year of the Julian Period anſwering to any given Year of the Olympiads, thereby may alſo be found the correſpondent Year (reſpectively) before or after Chriſt, viz. if the Year found of the Julian Period be leſs than 4713, then ſubſtract the ſame from 4713, and the remainder will ſhew the correſpondent Year before Chriſt; but if the Year found of the Julian Period be greater than 4713, then ſubſtract 4713 from it, and the remainder will ſhew the correſpondent Year after Chriſt, thus; it being found that Rome was built in Julian Period 3961, I ſubſtract 3961 from 4713, and there remains 752, the correſpondent Year before Chriſt wherein Rome was built.

But if there be no occaſion to find the correſpondent Year of the Julian Period, the Year before or after Chriſt reſpectively anſwering to any given Year of the Olympiads may be found thus; multiply, as before, the complete Olympiads by 4, and to the product add the Year given (if any be ſpecified) of the Olympiad running, this ſum, if it be leſs than 776, ſubſtract it from 776, and the remainder will ſhew the correſpondent Year before Chriſt; but if the ſum be greater than 776, then ſubſtract 776 from it, and the remainder will ſhew the correſpondent Year after Chriſt, thus; I would know what Year of Chriſt anſwers to the 4th Year of the 6th Olympiad, wherein Rome was built, according to Varro; wherefore (as before) 5 multiply'd 4, equal 20, and 20 more 4, equal 24, which ſum being leſs than 776, I ſubſtract it from 776, and there will remain 752, the correſpondent Year before Chriſt, as was found before by the other method.

Any Year of the Julian Period being given to find what Olympic Year anſwers thereto, work thus; from the Year given ſubſtract 3937, and divide the remainder by 4, the quotient will ſhew the complete Olympiads, and the fraction or remainder of the dividend will ſhew the Year of the Olympiad running; if there be no ſuch remainder, then it is the laſt or 4th Year of the Olympiad running. Ex. gr. I would know what Olympic Year anſwers to J. P. 3961, from 3961 I ſubſtract 3937, and there remains 24, which divided by 4 gives 6 in the quotient, and leaves no fraction of the dividend; wherefore the Olympic Year ſought is the 4th Year of the 6th Olympiad.

As the Account by the Olympiads was the principal Æra among the Greeks, ſo the principal Æra among the Romans was that of the U. C. Urbs Condita, or BUILDING OF ROME, which, according to Varro, began Julian Period 3961; but according to the Faſti Capitoline, not 'til the following Year, viz. Julian Period 3962.

Foraſmuch as Rome is computed to have been built 752 Years before Chriſt, therefore from 752 ſubſtract any given Year of U. C. leſs than the ſame, the reſidue will ſhew the correſpondent Year before Chriſt; or if the Year given of U. C. be greater than 752, then ſubſtract 752 from it, and the reſidue will ſhew the correſpondent Year after Chriſt, thus; the Regal State of Rome is computed to have ended in U. C. 245, to which anſwers the Year 507 before Chriſt; for 752 leſs 245 equal 507; and the removal of the Imperial Seat from Rome to Conſtantinople by Conſtantine the Great, is computed to have happen'd U. C. 1084, and ſo 332 Years after Chriſt; for 1084 leſs 752 equal 332.

As for other Epoch's or Æra's, they being of leſs note and uſe to us, it will be ſufficient to ſhew in brief how long before or after Chriſt each of them began.

	Before Chriſt
The Deſtruction of TROY is computed to fall in with Julian Period 3531, and ſo the Æra taken from thence to begin	1183
The Æra of NABONASSAR King of Babylon, from the beginning of whoſe Reign the Chaldeans and Egyptians reckon'd their Years, began Feb. 26. J. P. 3967, and conſequently	747
The Æra of the Death of ALEXANDER THE GREAT began Novemb. 12. J. P. 4390.	324
Some diſtinguiſh between the PHILIPPEAN, (ſo call'd from Philip Aridæus, brother to Alexander the Great) to begin from the Death of Alexander, or more exactly from Novemb. 12. following the Death of Alexander, and ſo J. P. 4390, and the ALEXANDREAN to begin not 'til 12 Years after Alexander's Death, viz. Octob. 1. J. P. 4402.	
The Æra of the City of ANTIOCH, uſed by Euſebius, Evagrius, Cedrenus, &c. began from the Autumn, J. P. 4665.	49
The Æra of the JULIAN REFORMATION OF THE CALENDAR, began Jan. 1. J. P. 4669. and ſo	45
The Æra ACTIACA, ſo denominated from the Victory obtain'd by Auguſtus over Anthony at Actium, began Aug. 29. J. P. 4684, and ſo	30
	After Chriſt
The DIOCLESIAN Æra, or Æra of the MARTYRS, otherwiſe call'd the Æra of the ABISSINIANS, began Aug. 29. A. D. So call'd from the multitude of Chriſtians that ſuffer'd Martyrdom in the Diocleſian Perſecution.	284

The

	A. C.
The Æra of the HEGIRA, or Flight of Mahomet from Mecca to Medina, uſed by the Turks and Arabs, began July 16. - -	622
The Æra of YEZDEGIRD, or the Perſian Æra, began - - -	632

From this Table of the Beginnings of the forementiond Æra's, it is eaſy to find out the Year before or after Chriſt which anſwers to any Year given of any of the ſaid Æra's, which are computed by Julian Years; as are the Æra's of the Deſtruction of Troy, of the Julian Reformation, of Diocleſian, &c.

But it is more difficult to do ſo in reſpect of the Æra of Nabonaſſar, of Alexander's Death, and of the Hegira, becauſe they are computed by Years different from the Julian Years, viz. 1461 Nabonaſſar Years make only 1460 Julian Years; and the ſame is to be underſtood of the Alexandrean Years, as being of the ſame kind with Nabonaſſar's.

The NICENE *RULE for finding* EASTER-DAY.

To which is added, the Roman *Method of dating or denoting the Days of the Month.*

THE Rule preſcribed by the Fathers of the Nicene Council for finding Eaſter-Day, and which is ſtill followed by the Church of England, is thus expreſſed in our Common Prayer Book:

> "Eaſter-Day is always the firſt Sunday after the firſt Full Moon which
> "happens next after the One and twentieth Day of March; and if
> "the Full Moon happens upon a Sunday, Eaſter-Day is the Sunday
> "following."

It is obſervable, that the Nicene Fathers in preſcribing this Rule did not act arbitrarily, but conformed themſelves as near as the difference of circumſtances would permit, to the Rule preſcribed by GOD for obſerving the Paſſover; to wit, the Rule for the Jewiſh Paſſover was, that it ſhould be kept on the Fourteenth Day, which is much the ſame as on the Full Moon of the firſt Eccleſiaſtical month call'd Niſan; and the Nicene Rule for Eaſter is, that it ſhall be kept on the Sunday next after the Fourteenth Day or firſt Moon of our firſt Eccleſiaſtical month, or that part of our March which anſwers to the Jewiſh month Niſan.

According to this Rule, Eaſter-Day may eaſily be found, by the help of the Golden Numbers duly affix'd to the Calendar, and by retaining in memory and applying to practice what has been ſaid of the Golden Numbers and Dominical Letters.

For Inſtance: I would know what Day Eaſter-Day will fall upon the Year 1730; in order hereto, firſt I inquire what is the Golden Number for the given Year, and I find it to be 2. according to the rule before given, then I inquire what is the Dominical or Sunday Letter for the given Year, and I find it to be D.

Now becauſe the Full Moon on which Eaſter depends is (according to the Nicene Rule) that which happens next after the 21ſt. of March, and becauſe the ſaid Full Moon is (agreeably to Exod. xii. 6.) to be eſteem'd the 14th day after its New Moon incluſively, i. e. the day of the ſaid New Moon being reckon'd the firſt of the 14th, and the day of the Full Moon the laſt, hence the ſaid Eaſter New Moon can never fall before the 9th of March, nor after the 5th of April; wherefore I look for the Golden Number 2. between March 9th and April 5th, and find it placed to March 12th, which therefore was the day on which the Eaſter New Moon fell at the time of the Nicene Council, in the 2d Year of the Moon's Cycle, and conſequently is eſteem'd ſo ſtill by us; wherefore the Eaſter Full Moon (being fourteen days after incluſively) will be March 25th. which being ſhewn by the Letter G affix'd to it, to be on a Wednesday, therefore by the Nicene Rule Eaſter-Day muſt be the Sunday after, viz. March 29th. And in like manner may Eaſter-Day be found for any other given Year, by the help of the Calendar adjoined to the End of this Section, and conſequently Tables may be made ſhewing the Day whereon Eaſter will fall for any Term of Years.

It remains now only to obſerve, that in order to render the following Calendar more uſeful, therein is ſet down the Roman manner of dating or denoting the ſeveral Days of the Year; where it is to be noted, that the Roman numbers between the words Calends, Nones, Ides, and Calends of the ſucceeding, do reſpectively refer always to the following word: Thus the number IV over-againſt Jan. 2. refers to the following Nones, and denotes as much as the 4th day of or before the Nones of January; ſo XI ſet to Jan. 22. denotes the 11th of or before the Calends of February. Wherefore any Roman date given may be turned into our date by finding in the Calendar the date given, (ſuppoſe 3. Id. Feb.) and ſeeing what date of ours anſwers thereto, viz. Feb. 11. and on the other hand, any date of ours being given, v. g. Jan. 31. it may be turned into the Roman date by finding the Roman date affix'd thereto, viz. Prid. Cal. Feb.

JANUARY.

Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.
3	1	A	Calend.
	2	B	IV
11	3	C	III
	4	D	Prid.
19	5	E	Nonæ
8	6	F	VIII
	7	G	VII
16	8	A	VI
5	9	B	V
	10	C	IV
13	11	D	III
2	12	E	Prid.
	13	F	Idus.
10	14	G	XIX
	15	A	XVIII
18	16	B	XVII
7	17	C	XVI
	18	D	XV
15	19	E	XIV
4	20	F	XIII
	21	G	XII
12	22	A	XI
1	23	B	X
	24	C	IX
9	25	D	VIII
	26	E	VII
17	27	F	VI
6	28	G	V
	29	A	IV
14	30	B	III
3	31	C	Pr. Cal.

FEBRUARY.

Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.
	1	D	Calend.
11	2	E	IV
19	3	F	III
8	4	G	Prid.
	5	A	Nonæ
16	6	B	VIII
5	7	C	VII
	8	D	VI
13	9	E	V
2	10	F	IV
	11	G	III
10	12	A	Prid.
	13	B	Idus
18	14	C	XVI
7	15	D	XV
	16	E	XIV
15	17	F	XIII
4	18	G	XII
	19	A	XI
12	20	B	X
1	21	C	IX
	22	D	VIII
9	23	E	VII
	24	F	VI
17	25	G	V
6	26	A	IV
	27	B	III
14	28	C	Prid. Cal.

MARCH.

Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.
3	1	D	Calend.
	2	E	VI
11	3	F	V
	4	G	IV
19	5	A	III
8	6	B	Prid.
	7	C	Nonæ
16	8	D	VIII
5	9	E	VII
	10	F	VI
13	11	G	V
2	12	A	IV
	13	B	III
10	14	C	Prid.
	15	D	Idus
18	16	E	XVII
7	17	F	XVI
	18	G	XV
15	19	A	XIV
4	20	B	XIII
	21	C	XII
12	22	D	XI
1	23	E	X
	24	F	IX
9	25	G	VIII
	26	A	VII
17	27	B	VI
6	28	C	V
	29	D	IV
14	30	E	III
3	31	F	Pr. Cal.

APRIL.				MAY.				JUNE.			
Gold.Numb.	Day of Mon.	Weekly Let.	Roman Date.	Gold.Numb.	Day of Mon.	Weekly Let.	Roman Date.	Gold.Numb.	Day of Mon.	Weekly Let.	Roman Date.
	1	G	Calend.	11	1	B	Calend.		1	E	Calend.
11	2	A	IV		2	C	VI	19	2	F	IV
19	3	B	III	19	3	D	V	8	3	G	III
8	4	C	Prid.	8	4	E	IV	16	4	A	Prid.
	5	D	Nonæ		5	F	III	3	5	B	Nonæ
16	6	E	VIII	16	6	G	Prid.		6	C	VIII
5	7	F	VII	5	7	A	Nonæ	13	7	D	VII
	8	G	VI		8	B	VIII	2	8	E	VI
13	9	A	V	13	9	C	VII		9	F	V
2	10	B	IV	2	10	D	VI	10	10	G	IV
	11	C	III		11	E	V		11	A	III
10	12	D	Prid.	10	12	F	IV	18	12	B	Prid.
	13	E	Idus		13	G	III	7	13	C	Idus
18	14	F	XVIII	18	14	A	Prid.		14	D	XVIII
7	15	G	XVII		15	B	Idus	15	15	E	XVII
	16	A	XVI	7	16	C	XVII	4	16	F	XVI
15	17	B	XV		17	D	XVI		17	G	XV
4	18	C	XIV	15	18	E	XV	12	18	A	XIV
	19	D	X I	4	19	F	XIV	1	19	B	XIII
12	20	E	XII		20	G	XIII		20	C	XII
1	21	F	XI	12	21	A	XII	9	21	D	XI
	22	G	X	1	22	B	X		22	E	X
9	23	A	IX	9	23	C	X	17	23	F	IX
	24	B	VIII		24	D	IX	6	24	G	VIII
17	25	C	VII	17	25	E	VIII		25	A	VII
6	26	D	VI	6	26	F	VII	14	26	B	VI
	27	E	V		27	G	VI	3	27	C	V
14	28	F	IV	14	28	A	V		28	D	IV
3	29	G	III	3	29	B	IV	11	29	E	III
	30	A	Pr. Cal.		30	C	III		30	F	Pr. Cal.
				11	31	D	Pr. Cal.				

JULY

JULY.				AUGUST.				SEPTEMBER.			
Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.	Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.	Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.
19	1	G	Calend.	8	1	C	Calend.	16	1	F	Calend.
8	2	A	VI	16	2	D	IV	5	2	G	IV
	3	B	V	5	3	E	III		3	A	III
16	4	C	IV		4	F	Prid.	13	4	B	Prid.
5	5	D	III	13	5	G	Nonæ	2	5	C	Nonæ
	6	E	Prid.	2	6	A	VIII		6	D	VIII
13	7	F	Nonæ		7	B	VII	10	7	E	VII
2	8	G	VIII	10	8	C	VI		8	F	VI
	9	A	VII		9	D	V	18	9	G	V
10	10	B	VI	18	10	E	IV	7	10	A	IV
	11	C	V	7	11	F	III		11	B	III
18	12	D	IV		12	G	Prid.	15	12	C	Prid.
7	13	E	III	15	13	A	Idus	4	13	D	Idus
	14	F	Prid.	4	14	B	XIX		14	E	XVIII
15	15	G	Idus.		15	C	XVIII	12	15	F	XVII
4	16	A	XVII	12	16	D	XVII	1	16	G	XVI
	17	B	XVI	1	17	E	XVI		17	A	XV
12	18	C	XV		18	F	XV	9	18	B	XIV
1	19	D	XIV	9	19	G	XIV		19	C	XIII
	20	E	XIII		20	A	XIII	17	20	D	XII
9	21	F	XII	17	21	B	XII	6	21	E	XI
	22	G	XI	6	22	C	XI		22	F	X
17	23	A	X		23	D	X	14	23	G	IX
6	24	B	IX	14	24	E	IX	3	24	A	VIII
	25	C	VIII	3	25	F	VIII		25	B	VII
14	26	D	VII		26	G	VII	11	26	C	VI
3	27	E	VI	11	27	A	VI	19	27	D	V
	28	F	V		28	B	V		28	E	IV
11	29	G	IV	19	29	C	IV	8	29	F	III
	30	A	III	8	30	D	III		30	G	Pr. Cal.
19	31	B	Pr. Cal.		31	E	Pr. Cal.				

P

OCTOBER.

OCTOBER.

Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.
16	1	A	Calend.
5	2	B	VI
13	3	C	V
2	4	D	IV
	5	E	III
10	6	F	Prid.
	7	G	Nonæ
18	8	A	VIII
7	9	B	VII
	10	C	VI
15	11	D	V
4	12	E	IV
	13	F	III
12	14	G	Prid.
1	15	A	Idus
	16	B	XVII
9	17	C	XVI
	18	D	XV
17	19	E	XIV
6	20	F	XIII
	21	G	XII
14	22	A	XI
3	23	B	X
	24	C	IX
11	25	D	VIII
	26	E	VII
19	27	F	VI
8	28	G	V
	29	A	IV
16	30	B	III
5	31	C	Pr. Cal.

NOVEMBER.

Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.
	1	D	Calend.
13	2	E	IV
2	3	F	III
	4	G	Prid.
10	5	A	Nonæ
	6	B	VIII
18	7	C	VII
7	8	D	VI
	9	E	V
15	10	F	IV
4	11	G	III
	12	A	Prid.
12	13	B	Idus
1	14	C	XVIII
	15	D	XVII
9	16	E	XVI
	17	F	XV
17	18	G	XIV
6	19	A	XIII
	20	B	XII
14	21	C	XI
3	22	D	X
	23	E	IX
11	24	F	VIII
19	25	G	VII
	26	A	VI
8	27	B	V
	28	C	IV
16	29	D	III
5	30	E	Pr. Cal

DECEMBER.

Gold. Numb.	Day of Mon.	Weekly Let.	Roman Date.
13	1	F	Calend.
2	2	G	IV
	3	A	III
10	4	B	Prid.
	5	C	Nonæ
18	6	D	VIII
7	7	E	VII
	8	F	VI
15	9	G	V
4	10	A	IV
	11	B	III
12	12	C	Prid.
1	13	D	Idus
	14	E	XIX
9	15	F	XVIII
	16	G	XVII
17	17	A	XVI
6	18	B	XV
	19	C	XIV
14	20	D	XIII
3	21	E	XII
	22	F	XI
11	23	G	X
	24	A	IX
19	25	B	VIII
8	26	C	VII
	27	D	VI
16	28	E	V
5	29	F	IV
	30	G	III
13	31	A	Pr. Cal.

HAVING ſhewn how to find Eaſter-Day according to the Julian or Old Account uſed by us in Great Britain and Ireland, it may not be improper to adjoin here by way of Annotation the Method of finding Eaſter-Day according to the Gregorian or New Account uſed in all Countries where the Roman Catholick Religion is eſtabliſhed.

Now this is done by help of the Table here ſubjoin'd, wherein in the firſt Column are contain'd the Gregorian Epacts that are now and will be in uſe 'til 1800 excluſively, and in the ſecond Column are ſet down the Days whereon falls the Eaſter Full Moon, and in the third Column is ſet down the Weekly Letter anſwering to the ſaid Days of the Eaſter Full Moon.

Epacts.	Full Moons.	Week. Letter.	Epacts.	Full Moons.	Week. Letter.
X	13 April	E	IX	4 April	C
XI	2 April	A	XX	24 March	F
XXII	22 March	D	I	12 April	D
III	10 April	B	XII	1 April	G
XIV	30 March	E	XXIII	21 March	C
XXV	18 April	C	IV	9 April	A
VI	7 April	F	XV	29 March	D
XVII	27 March	B	XXVI	17 April	B
XXVIII	15 April	G	VII	6 April	E
			XXVIII	26 March	A

The Uſe of the foregoing Table is this: Having found (as is ſhewn before) the Gregorian Epact and Sunday Letter, over-againſt the ſaid Epact is placed the Day whereon falls the Eaſter Full Moon, and thereto is affix'd its reſpective Letter, from which therefore you are to reckon in an Alphabetical order 'til you come to the Sunday Letter for that Year, and the Day of the Month anſwering to the ſaid Sunday Letter is the Gregorian Eaſter-Day; only if it happens that the Full Moon falls on a Sunday, then (according to the Nicene Rule) the Sunday next following is the Gregorian Eaſter-Day.

Examp. For the Year 1730. I would know what is the Gregorian Epact, Sunday Letter, Full Moon, and Eaſter-Day: I have before ſhewn that if the Julian Epact be greater than 11, ſubſtract 11 from it, and the remainder is the Gregorian Epact; but if the Julian Epact be leſs than 11, you muſt add 30 to it, that ſo ſubſtraction may be made: But in our preſent Example 1730, the Julian Epact will be 22, from which if I ſubſtract 11, the remainder, which is 11, is the Gregorian Epact. Now by the foregoing Table you learn, that when the Gregorian Epact is 11, the Eaſter Full Moon according to the Gregorian Account will fall on April the 2d. N. S. (that is, March 22d. O. S.) to which anſwers the Letter D, as may be ſeen in the foregoing Calendar.

Always obſerve, that having found the Sunday Letter according to the Julian Account, the Gregorian Sunday Letter will be the third in a backward order from the Julian, thus, for the Year 1729, the Sunday Letter according to the Julian Account is E, wherefore counting in a backward order from E to B, the laſt is the Gregorian Sunday Letter.

To find the Dominical Letter *for any Year, both in the* Engliſh *and* Foreign *Account.*

For the ENGLISH ACCOUNT: Divide the Year of our Lord by 4, and add the quotient (not regarding the remainder) to the Year propoſed, and to their ſum add 4, then divide this laſt ſum by 7, (not regarding the quotient, but) noting the remainder; for the complement of this remainder to 7 ſhall ſhew the number of the Letter, reckoning A 1, B 2, C 3, D 4, &c. Note, if there be no remainder when you divide the Year by 4, that then 'tis Leap-year, and conſequently has 2 Dominical Letters that Year, whereof this rule finds the laſt, the firſt is the next Letter in the order there mention'd, except the laſt Letter be found to be G, and then the firſt Letter will be A.

Otherwiſe, firſt find the Cycle of the Sun for the Year propoſed by the forementioned rule, then to the Cycle of the Sun add 3, and divide it by 4, add the quotient (not regarding the remainder) to the Cycle of the Sun, and divide the ſum by 7, (not regarding the quotient, but) noting the remainder; for that will ſhew the Letter, if you count them in the order there mention'd, viz. G 1, F 2, E 3, D 4, &c.

Note, 1. If when you divide by 7 nothing remain, then 7 is ſuppoſed to remain, and the Letter is A.

2. If when you divide by 4 nothing remains, it is Leap-year, and conſequently are 2 Dominical Letters, of which this rule finds the laſt, the firſt is the next in the order of the Alphabet, except the laſt be G, and then the firſt is A.

For the FOREIGN ACCOUNT: Having found the Dominical Letter according to the Engliſh Account, find the number of the Letter according to the order of the Alphabet, viz. A 1, B 2, C 3, &c. and ſubſtract 3 therefrom, the remainder will ſhew the Dominical Letter in the Foreign Account; thus for the Year 1729 the Dominical Letter is B.

APPENDIX:

Containing ſome

Brief RULES in Meaſuring *of* Superficies *and* Solids.

IN Meaſuring any of theſe Things conſideration muſt be firſt had to the juſt Form and Figure thereof, with the various Kinds thereof, which are ordinarily three:

1. Lineal, call'd (by Workmen) running Meaſure, in that it reſpects Length only; the Parts of which are theſe following:

12 inches	1 foot.
3 foot	1 yard.
16 feet and a half	1 perch, pole, or rodd.

2. Superficial, or Square Meaſure, in that it reſpects Length and Breadth; and its parts are as followeth, viz.

144 inches	1 foot.
72 inches	half a foot.
36 inches	a quarter of a foot.
48 inches	1-3d of a foot.
18 inches	1-8th or half a quarter of a foot.
272 feet and a qr.	1 perch or rod.
136 feet	half a rodd.
1296 inches or 9 feet	1 yard.

Note, That Workmen very often in dividing by 272 1-4th, (which reduces Superficial Feet into Square Rods) take no notice of the 4th of the foot, dividing by 272 only, which gives the content a little too much.

3. Solid or Cube Meaſure has reſpect to Length, Breadth, and Thickneſs; whoſe parts are theſe following, viz.

1728 inches	1 foot.
1296 inches	3-4ths of a foot.
864 inches	half a foot.
432 inches	1-4th of a foot.
27 feet	1 yard.

Foraſmuch as it is very neceſſary that every Maſter Workman ſhould know how to meaſure all manner of Buildings, as Walls, Timber-work, Tiling, Floors, Joyners, Painters, Glaſiers, Bricklayers, Maſons, Plaiſterers, &c. that ſo an Eſtimate may be taken or given (nearly) of the Charge of a Piece of Work; I have therefore in the following Pages given brief and neceſſary Rules for the ſpeedy meaſuring of each Particular.

And firſt, Of SUPERFICIAL MEASURE.

A General Rule. Multiply the Length by the Breadth, and the Product is the Superficial Content.

Now the Square of any thing is found three ſeveral Ways: 1. By Decimals. 2. By Aliquot Parts. 3. By Croſs Multiplication.

Examp. Admit a Stone whoſe Breadth is 2 foot 3 quarters or 75 parts, and Length 4 foot and a half, how many ſquare or ſuperficial feet are contain'd in it? Examples of each follow.

```
                          feet. inches.
  2 : 75              |  2   9             |      2 : 75
    45                |  4   5             |           5
  1375                |  8   0             |       1375
  1100                |  3   0             |          9
 12 ] 375 firſt way   |  0  10             |   12 ] 375
                      |       3  9         |        third way.
                      | 12   5  9 ſecond way
```

How many foot of Glaſing is there in a Pane of Glaſs that is 3 foot 9 inches high, and 2 foot 3 inches wide?

```
feet. inch.          feet. parts.
 3   9                3   75
 2   3                2   25
 6   0               1875
 1   6               750
 0   9              750
      2   3         8 ] 4375 content.
 8   5   3 content.
```

Suppoſe a Yard paved with Free-ſtone, viz. Length 22 feet 4 inches, Breadth 19 feet 7 inches, how many ſquare feet?

```
 22   4 broad.
 19   7 long.
 198
 22
 418   0
  12  10
   6   4                 f.  in. pt.    yd. f. p.
       2   4 fecit  437  4   4    or  48  7  1
 437   4   4
```

In PAINTING.

Examp. The Height of a Room being 12 feet 4 inches, and 84 feet 11 inches about, how many ſquare yards?

```
  84   11 about.
  12    4 high.
 1019   0   0
   28   2   8      yds.  f.  in.  pts.
 9)1047  3   8   (116    3   3    8  Anſw.
```

JOINERY.

How many Yards of Wainſcot doth that Room contain, whoſe Height is 12 feet 3 inches, and Compaſs 104 feet 6 inches?

104 6 — 104
12 3 — 3
1248 0 — 12)312(26
26 0 — 7
6 0
1 6 — yds. f. in.
9)1280 1 6 (142 2 2 Anſw.

PLAISTERING.

How many Yards is contained in a Cieling that is 47 feet 4 inches 7 parts long, and 18 feet broad?

47 4 7
6
284 3 6
3 — yds. f. in. pts.
9)852 10 6 (94 6 10 6 Anſw.

Note, That if you multiply 1 3d part of the Length by 1 3d part of the Breadth, the Product will be the Content in ſquare Yards; it being the ſame to take 1-3d of Lineal, as 1-9th of Superficial Meaſure.

By the SQUARE, as Partitioning, Flooring, Roofing, Tyling.

Altho' the Dimenſions are taken in feet and inches, yet the Content of Value is by the Square of 10 feet, which is no more but cutting off two figures of the ſuperficial feet towards the right hand.

Examp. How many Squares are contained in a Floor that is 199 feet 10 inches long, and 10 feet 7 inches high?

199 10 long.
10 7 high.
1998 4
66 7 4
49 11 6 — ſq. f. in. pts.
21, 14 10 10 — 21 14 10 10 Anſw.

Ex. 2. A Floor being 49 feet 7 inches 4 parts long, and 26 feet 6 inches broad, how many Squares are contained in it?

49 7 4
26 6 0
1289 10 8
24 9 8
13, 14 8 4 Anſw.

Ex. 3. Admit an Houſe be 18 feet 4 inches in Front, and 37 feet 10 inches in Height, how many Square in the Roof?

37 10
3
113 6
6
1 3d)681 0
12 7 4
1 half)693 7 4
346 9 8
10 40 5 0

ſq. f. in.
10 40 5 Anſw.

Here note, That after you have multiplied the Depth by the Front, and found the Content of the Ground-plot in feet, half of which being added gives the Content of the Pitch Roof, which may be reduced into Squares.

By the RODD, as in Brick-work.

The Dimenſions of this kind are taken in feet and inches, and the Content is given by the Square of a Rodd of 16 and a half. The Content of this Work is found in the ſame manner as all the other, to wit, by multiplying the Length by the Breadth, and is different from the former in theſe two things :

1. When you have found the ſuperficial Content in feet, divide it by 272 1 4th, the ſquare feet in one Rodd, and the quotient is Rodds.

2. That when it is more or leſs than a Brick and half thick, it muſt be reduced into that Thickneſs, being always meaſured by the ſquare Rodd of a Brick and half.

The RULE. Multiply the Product of the Length and Height of the Wall by as many half Bricks as the Wall is in Thickneſs, which Product being divided by 3, muſt conſequently give the Content of the Wall of a Brick and half thick ; which ſuperficial feet being divided by 272 1 4th, gives in the Quotient ſquare Rodds reduced to a Brick and half ; or it may be more nearly found by the adjoining Table.

Brick	
For 1 ſubſtract 1-3d,	Reduces the thickneſs of the Wall into a Brick and half.
2 add 1-3d,	
3 multiply by 2,	
4 & half, multiply by 3,	
6 multiply by 4,	

Examp. 1. Suppoſe a Wall of a Garden 213 feet long, and 13 feet 4 inches high, and a Brick and half thick, how many Rodd is contained in it?

213 0 long.
13 4 high.
2769 0
71 0
272:5)2840 0 (10 115

Or thus.
213 long.
13 4 high.
639
213
2769
71
2840 as before

Ex. 2. How many Rodd of Brick-work is in that Wall which is 40 feet 7 inches long, and 11 feet high, being 1 Brick thick?

40 7 long.
11 0 high.
3)446 5
148 9 8
272:3)297 7 4

rod. f. in. pts.
(1 25 7 4

If a Wall be 254 feet about, and 12 feet 7 inches high, and 3 Bricks thick, how many Rodd?

254	0	about.
12	7	high.
3048	0	
148	2	
3126	2	
	2	r. f. in.
272) 6392	4	(23 136 4

If a Board be 13 feet long, and 16 inches broad, how many feet are contained therein?

13		
16		
78		
13	f.	in.
12) 208	(17	4 fecit.
8(4		

A Board 11 feet long, and 10 inches broad, how many feet is contained in it?

11	
10	
12) 110	(9 $\frac{2}{12}$
(2	

II. OF SOLID MEASURE.

Admit a Piece of Timber or Block of Stone 3 feet 8 inches wide, 4 feet 9 inches long, and 2 feet 7 inches deep, how many ſolid or cubical feet are contained in it? See the Work.

17	5		ſuperficial.
2	7		depth.
34	0		
9	11		
	10		
	2	11	
44	11	11	ſolidity.

3	8	
4	9	
12	0	
2	3	
2	8	
	6	
17	5	ſuperficial.

OBSERVATION. In multiplying feet, inches, and parts of inches by feet, inches, and parts of inches, take this General

RULE: 1. Feet multiplied by feet, the Product is Feet.

2. Feet multiplied by inches, the Product is Inches, which divided by 12 produces feet.

3. Parts multiplied by feet, the Product is Parts, which divided by 12 produces inches.

4. Parts multiplied by inches, the Product is Seconds, which divided by 12 produces Parts.

feet.	in.	pts.	
57	10	6	
15	8	9	
285			
57			
855	0		
38	0		
12	6		
3	6	9	
	7	6	
	4	0	
		4	6
910	0	7	6

f.	in.	pts.	ſec.
910	00	07	06
Anſw.			

5. And laſtly, Parts multiplied by parts, the Product is Thirds, and the twelfth part is Seconds.

See the whole Work, above.

```
          f.  in.
Length   57  10  1 half   694 5
Height   15   8  3-4ths. 18875
                         ------
                          34725
                         48615
                        55560
Decimally               55560
                        6945
                  ---------------
             144) 131086:875(910 325
                        144 69 (75
                              3 7
```

Admit a Room whoſe Girt or Compaſs is 256 feet 6 inches, and Height 15 feet 9 inches, how many ſquare Yards of Wainſcot are contained therein?

1. Multiply 256 feet 6 inches by 15 feet 9 inches, the Product is 4039 feet 10 inches, which divided by 9 gives 448 yards 7 feet 10 inches.

```
 256   6 Compaſs.
  15   9 Height.
 ---------
 1280                   15        256
 256                     6          9
 ---------             ----       ----
 3840   0               90        2304
  199   6                           90
        4   6                    ------
 -----------                 12) 2394 (199
9)4039 10   6                     1111 (6
   47
 ---------
 448  7 10
```

2. Let us ſuppoſe all the Window-Jaums and Saphataes to be 56 feet 4 inches, and their Breadth 2 feet 2 inches, which multiplied produces 122 feet 8 inches, and divide by 9 the quotient is 13 yards 5 feet 8 inches.

3. All the Window-ſhutters about the Room are in Girt or Breadth 28 feet 3 inches, and the Length or Height 5 feet 7 inches, which multiplied and divided makes 17 yards 4 feet 8 inches 3-4ths, and its half is 8 yards 8 feet 4 inches 1 half, makes 26 yards, &c.

```
        28   3
         5   7
       --------
       140   0
        16   4
         1   3
           1   9
       ----------
     9)157   8   9
         6  (4
       ----------
Total   17   4   8   9
Half     8   8   4   4   6
       ------------------
        26   1   1   1   6
```

Here follows an Example wrought by four various Operations, viz. Admit an oblong Yard or Pavement whoſe Dimenſions are as follow.

1. Vulgar.
feet.
Length 243 3-4th
Breadth 81 1 half

Improper Fractions | 975 / 4
163 / 2

975
163
2925
5850
975
8) 158925
19865 $\frac{5}{8}$ feet, or
2207 yds. 3 $\frac{2}{9}$ f.

2. Croſs Multiplication.

243 9
81 6
243
1944
19683
121 6
60 9
4 6
19865 7 6
or
2207 3 6 yds.

3. Decimally.

243 75
81 5
121875
24375
195000
19865 625
or
2207 291 yds.

4. In Yards.

81 3
27 2
567
162
2187 0
13 6
6 9 6
2207 3 9

So that here you ſee four ſeveral Methods of working this Propoſition; firſt by Vulgar, by reducing the Length and Breadth into an improper Fraction, and multiplying and dividing as above in Nº 1. the ſecond by Croſs Multiplication; the third by Decimal; and the fourth I have reduced into Yards, and multiplied Yards and Feet by Yards and Feet, which gives the Product at one Operation, as you ſee in the Work above.

To multiply Numbers of ſeveral Denominations.

1. By whole Numbers.

l. s. d.
47 18 11
8
383 11 4

C. qr. lb.
9 3 15
6
59 1 6

C. qr. lb.
21 3 8 by 36
6
130 3 20
6
785 2 8

By Parts inſtead of the Whole.

yds. qr. in.
47 3 3 mult. by 45
5
239 2 3
9
2157 0 3

By Mix'd Numbers.

C.	qr.	lb.	
9	3	15	by 11 1 half
		11	
108	2	25	
4	3	21	1 half
113	2	18	1 half

l.	s.	d.	
39	18	11	by 9
		9	
359	10	3	
9	19	8	3-4th.
362	9	11	3-4th.

l.	s.	d.	
47	18	11	
		4	
191	15	8	
		7	
1342	9	8	
11	19	8	3-4th.
1330	9	11	1-4th.

In the firſt of theſe three Examples I multipy by 11, adding 1 half of the Multiplicand for the half. In the ſecond I multiply by 9, adding a fourth for 1-4th. In the third I multiply by 4, and that Product by 7 gives 28 times the Sum, from which ſubſtracting 1-4th of the firſt Sum, the Remainder is the Product of the given Sum multiplied by 27 3-4ths.

By Numbers of ſeveral Denominations.

	F.	I.	P.
	47	08	06
	9	04	04
	429	04	06
1-3d	15	10	10
1-12th	1	02	10
	446	07	02

By Aliquot Parts.

F.	I.	
47	08	
23	05	
141	00	
94	00	
20	05	
15	04	
	3	4
271	00	4

F.	I.	
47	08	
9	04	
423	00	
15	08	
6	00	
	02	8
444	10	8

A Painter has painted a Pillar that is 5 feet 10 inches in Circumference, and 12 feet 8 inches long, how many ſquare Yards of Painting are contained in it ?

Here you have the Example wrought by Croſs Multiplication and by Aliquot Parts, the Sum or Product in Yards being equal.

Croſs Multiplic.

	f.	in.		
	12	8		
	5	10		
	60	0		
	10	0		
	3	4		
		6	8	
9)	73	10	8	
Fecit Yards	8	2	6	2-9

By Aliquot Parts.

	f.	in.		
	12	8		
	5	10		
	63	4		
	6	4		
	4	2	8	
9)	73	10	8	
	8	2	6	2-9

How to meaſure SQUARE PILLARS.

The RULE. Add the 4 Breadths together, and multiply the Total by the Length or Height.

Of REGULAR POLIGONS.

Add all the Breadths together, (be they of as many Sides as they will) and multiply the Total by the Length, and the Product gives the ſuperficial Content.

Of CONES.

Multiply half the Circumference at the Baſe by the Length, or half the Length by the Circumference, gives the Content.

Of PYRAMIDS.

Add all the Breadths at the Baſe together, and multiply half the Total by the Length, or half the Length by the Total.

Of GLOBES.

Multiply the Diameter by the Circumference of the ſame, and the Product is the Content, or multiply the Area of the Circle by 4, and it will produce the Content.

To find the Superficies of the SEGMENT of a GLOBE.

Multiply the Circumference of the Globe or Sphere by the Segment's Altitude, and the Product is the ſuperficial Content.

How to meaſure an ELLIPSIS or OVAL.

Multiply the greater Diameter by the leſs, and take the 1-7th of the Product, and the half of that, and ſubſtract their Total from the Product.

How many ſolid feet are contained in that Piece of Timber whoſe Length is 17 feet and a half, Breadth 23 inches, and Depth 2 feet 7 inches?

Which is the number of ſolid feet contained in the aforeſaid Piece of Timber.

33 6 6	17 6
2 7 0	1 11
66 0	17 0
19 3	15 7
1 0	6
3 6	5 6
3 6	33 6 6
86 6 9 6	

A Court is to be paved that is 18 feet and a half long, and 14 feet broad, how many Yards ſquare will there be in the Pavement?

Firſt, I put the Feet into Yards both of the Length and Breadth, and then multiply the one by the other, thus; viz. firſt I multiply 6 yards 0 feet 6 inches by 4 yards, then for the 2 feet 6 inches I take 1-3d for 1 foot, (becauſe 1 foot is the 1-3d of a yard) then for 1 foot and a half I take the half, that being the half of a yard.

yds.	f.	in.	
06	00	06	
4	02	06	
24	02	00	
2	00	02	
3	00	03	
29	02	05	fecit

Examp. Multiply 6378 04 08 by 349 06 09

	349	06	09		
	57402				
	255120				
	1913400				
By taking half the Product	3189	02	04		
	398	07	09	06	
	116	04	00	00	
	19	04	08	00	
Total Sum	2229645	06	09	06	fecit.

Admit a Piece of Timber 14 feet and a half long, 8 inches broad, and 9 inches thick, how many foot of Timber is contained therein?

So that you ſee this Piece of Timber contains 7 ſolid feet and 3 or 3 twelfths of a foot, or 1-4th equal to a quarter, or 7 feet 1-4th Total.

	f.	in.	
	14	6	long.
1-3d	4	10	ſubſtracted.
	9	8	remain.
1-4th	2	5	ſubſtracted.
	7	3	remain.

Of ARCHITECTURE, *according to Mr.* Neve, in 12 PROBLEMS; being uſeful for Carpenters and Builders.

PROB. 1. To find the Length of the Timber, &c. of a ſquare Building at True Pitch, the Breadth of the Houſe being given.

For the eaſier ſolving of this Problem take the following Table.

Names of the Timbers, &c.	feet.
The Breadth of the Houſe	20 00
The Length of the Rafter	15 00
The Length of the Hip	18 02
The Length of the Perpedicular	11 18
The Half-Diagonal	14 14

In this Table the Breadth of the Houſe being 20 feet, the Length of the Timber, &c. are as is there expreſſed; whence 'tis eaſy to find them in any other ſquare Frame by this

Rule. As 20 is to the Breadth (in feet) of any ſquare Frame, ſo is the Number (in the Table) againſt any one of the Timbers, &c. to the reſpective Length of that Timber, &c.

Examp. Let there be given the ſquare Frame of a Houſe 40 feet broad, and let the Rafters be deſigned to be True Pitch; What muſt be the Length of the Rafters and Hips of this Building?

To anſwer this Queſtion I ſay (by the Rule) as 20 : 40 : : 15 : 30, the Length of the Rafters. Again, I ſay, as 20 : 40 : : 18 : 02 : 36 : 04, the Length of the Hips. In the ſame manner, the Length of the Perpendicular will be found to be 22 : 36, and the Half-Diagonal 28 : 28. So that you ſee this Problem comprehends 4 Problems.

Prob. 2. To find tho Length of the Collar-Beams in any ſquare Frame at True Pitch.

The Rule. As the Length of the Rafters (which may be found by Prob. 1.) is to the Breadth of the Houſe, ſo is the Diſtance from the Top of the Rafters to the Collar-Beam to the Length ſought.

Examp. Let the Frame be 20 feet wide, the Rafters 15 feet long, and the Collar-Beams 6 feet from the Top; What muſt their Length be? Anſw. 8 feet; for as 15 : 20 : : 6 : 8.

Prob. 3. To find the Length of the Purloyns in a ſquare Frame hipt at one End, or both Ends, the Rafters being True Pitch.

The Rule. Firſt find the Length of the Rafters by Prob. 1. then ſay, as the Length of the Rafters is to the Breadth of the Houſe, ſo is the deſigned Diſtance of the Purloyn from the Top of the Rafter to a 4th; then if the Houſe be hipt but at one End, or at both Ends, ſubſtract the half, or the whole Breadth of the Houſe from the Remainder; then to this Remainder add the 4th, or double the 4th Proportional found, their Sum ſhall be the Length of the Purloyn ſought.

Prob. 4. To find the Length of the Rafters in a ſquare Frame at any Pitch.

Before I give the Rule to ſolve this Problem, it may be neceſſary to note, That the Breadth of the Houſe is always given; and the Length of the Rafter or Height of the Perpendicular is next reſolved on: So that if one of them be ſought, the other is (always) known by Aſſumption. This being premiſed, the Problem may be ſolved by this

Rule. To the Square of half the Breadth of the Houſe add the Square of the Perpendicular, their Sum is the Square of the Rafters Length:

therefore the Square Root being extracted gives the Length of the Rafter ſought.

Prob. 5. The Rafters Length being given, to find the Perpendicular in any ſquare Frame.

Sometimes (as I noted above) the Length of the Rafters are aſſigned, and then the Perpendicular muſt be found, which may be done by this

Rule. From the Square of the Rafters Length ſubſtract the Square of half the Breadth of the Houſe, the Square Root of the Remainder is the Perpendicular ſought.

Prob. 6. To find the Half-Diagonal (or Diſtance from the Corner to the King-Poſt) in any ſquare Frame.

Rule. Square the half Breadth of the Houſe, which multiply by 2, the Square Root of the Product is the Half-Diagonal ſought.

Prob. 7. To find the Length of the Hips in a ſquare Frame at any Pitch.

Rule. Firſt find the Length of the Rafters by Prob. 4. then to the Square of the Rafters Length add the Square of the half Breadth of the Houſe, the Square Root of the Sum is the Length of the Hip. Otherwiſe; Firſt find the Half-Diagonal by Prob. 6. then to the Square of the Half-Diagonal add the Square of the Perpendicular, the Square Root of the Sum is the Length of the Hip.

Prob. 8. To find the Length of the Rafters in a Bevel Frame at any Pitch.

Rule. To the Square of the half Breadth of the Houſe (taken perpendicularly, and not according to the Bevelling) add the Square of the Perpendicular, the Square Root of the Sum is the Length of the Rafter.

Prob. 9. To find the Perpendicular in a Bevel Frame, the Length of the Rafters being given.

Rule. From the Square of the Rafters Length ſubſtract the Square of half the Breadth of the Houſe, (taken as in Prob. 8.) the Square Root of the Remainder is the Perpendicular ſought.

Prob. 10. To find the Half-Diagonals in a Bevel Frame.

In a Bevel Frame the Half-Diagonals are unequal: to find them this is

The **Rule.** Conſider the Bevelling, (i. e. how much the Bevelling makes the Frame longer than the Square from the ſhorteſt Corner) and take the half thereof; let this half be added to or ſubſtracted from the half Breadth of the Frame, (taken according to the Bevelling) noting the

Sum or Remainder; for if to the Square of this Sum or Remainder you add the Square of half the Breadth of the Frame, (taken perpendicularly) the Square Root of the Sum ſhall give the longer or ſhorter Diagonal Length.

Prob. 11. To find the Length of the Hips in a Bevel Frame.

Rule. Firſt find the Length of the Rafter by Prob. 8. then add or ſubſtract half the Bevelling to or from the half Breadth of the Frame (taken according to the Bevelling) and to the Square of the Sum or Remainder add the Square of the Rafters Length, the Square Root of the Sum is the longer or ſhorter Hip. Otherwiſe; Firſt find the Half-Diagonal by Prob. 10. then to the Square of the Perpendicular add the Square of the longer or ſhorter Half-Diagonal, the Square Root of the Sum is the longer or ſhorter Hip.

Prob. 12. To find the Length of the Rafters in a taper Frame, being broader at one End than at the other.

Rule. In this caſe the Perpendicular is the ſame throughout the Roof, but the Length of the Rafters are unequal; therefore to find the Length of each Pair of Rafters, the Breadth of the Houſe muſt be taken betwixt their Feet, and then the Operation is the ſame as in Prob. 4.

Note, 1. That to the Length of Timber found by theſe Rules, you muſt add ſufficient Length for the Feet of the Rafters, and Tenons of the Collar-Beams, &c.

2. That the Length of Sleepers in all Roofs are the ſame as the Hips; a Sleeper being the ſame in the Middle of a Roof as a Hip at the End.

3. That 'tis difficult to find the Diagonals and Hips in Taper and Bevelling Frames, Arithmetically, without Sines and Tangents: For Mr. Brown in his Appendix to Scamozzi's Architecture goes upon wrong Principles; but at preſent I ſhall wave it.

The Price of the Commodity by the Tun, Hundred, Pound, Ounce, Dozen, Yard, Ell, &c.

The QUANTITY bought or ſold.

Num.	1 farthing.				2 farthings.				2 farthings.				1 Penny.			2 Pence.		
	l.	s.	d.	q.	l.	s.	d.	q.	l.	s.	d.	q	l.	s.	d.	l.	s.	d.
1		0	0	1		0	0	2		0	0	3		0	1		0	2
2		0	0	2		0	1			0	1	2		0	2		0	4
3		0	0	3		0	1	2		0	2	1		0	3		0	6
4		0	1			0	2			0	3			0	4		0	8
5		0	1	1		0	2	2		0	3	3		0	5		0	10
6		0	1	2		0	3			0	4	2		0	6		1	0
7		0	1	3		0	3	2		0	5	1		0	7		1	2
8		0	2			0	4			0	6			0	8		1	4
9		0	2	1		0	4	2		0	6	2		0	9		1	6
10		0	2	2		0	5			0	7	2		0	10		1	8
20		0	5			0	10			1	3			1	8		3	4
30		0	7	2		1	3			1	10	2		2	6		5	0
40		0	10			1	8			2	6			3	4		6	8
50		1	0	2		2	1			3	1	2		4	2		8	4
60		1	3			2	6			3	9			5	0		10	0
70		1	5	2		2	11			4	4	2		5	10		11	8
80		1	8			3	4			5	0			6	8		13	4
90		1	10	2		3	9			5	7	2		7	6		15	0
100		2	1			4	2			6	3			8	4		16	8
200		4	2			8	4			12	6			16	8	1	13	4
300		6	3			12	6			18	9		1	5	0	2	10	0
400		8	4			16	8		1	5	0		1	13	4	3	6	8
500		10	5		1	0	10		1	11	3		2	1	8	4	3	4
600		12	6		1	5	0		1	17	6		2	10	0	5	0	0
700		14	2		1	9	2		2	3	9		2	18	4	5	16	8
800		16	4		1	13	4		2	10	0		3	6	8	6	13	4
900		18	9		1	17	6		2	16	2		2	15	0	7	10	0
1000	1	0	10		2	1	8		3	2	6		4	3	2	8	6	8
2000	1	1	8		4	3	4		6	5	0		8	6	8	16	13	4
3000	3	2	6		6	5	0		9	7	6		12	10	0	25	0	0
4000	4	3	4		8	6	8		12	10	0		16	13	4	33	6	8
5000	5	4	2		10	8	4		15	12	6		20	16	8	41	13	4
10000	10	8	4		20	16	8		31	5	0		41	13	4	83	6	0

The Price of the Commodity by the Tun, Hundred, Pound, Ounce, Dozen, Yard, Ell, &c.

	Num.	3 Pence.			4 Pence.			5 Pence.			6 Pence.			7 Pence.		
		l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.
The Quantity bought or ſold.	1		0	3		0	4		0	5		0	6		0	7
	2		0	6		0	8		0	10		1	0		1	2
	2		0	9		1	0		1	3		1	6		1	9
	4		1	0		1	4		1	8		2	0		2	4
	5		1	3		1	8		2	1		2	6		2	11
	6		1	6		2	0		2	6		3	0		3	6
	7		1	9		2	4		2	11		3	6		4	1
	8		2	0		2	8		3	4		4	0		4	8
	9		2	3		3	0		3	9		4	6		5	3
	10		2	6		3	4		4	2		5	0		5	10
	20		5	0		6	8		8	4		10	0		11	8
	30		7	6		10	0		12	6		15	0		17	6
	40		10	0		13	4		16	8	1	0	0	1	3	4
	50		12	6		16	8	1	0	10	1	5	0	1	9	2
	60		15	0	1	0	0	1	5	0	1	10	0	1	15	0
	70		17	6	1	3	4	1	9	2	1	15	0	2	0	10
	80	1	0	0	1	6	8	1	13	4	2	0	0	2	6	8
	90	1	2	6	1	10	0	1	17	6	2	5	0	2	12	6
	100	1	5	0	1	13	4	2	1	8	2	10	0	2	18	4
	200	2	10	0	3	6	8	4	3	4	5	0	0	5	16	8
	300	3	15	0	5	0	0	6	5	0	7	10	0	8	15	0
	400	5	0	0	6	13	4	8	6	8	10	0	0	11	13	4
	500	6	5	0	8	6	8	10	8	4	12	10	0	14	11	8
	600	7	10	0	10	0	0	12	10	0	15	0	0	17	10	0
	700	8	15	0	11	13	4	14	11	8	17	10	0	20	8	4
	800	10	0	0	13	6	8	16	13	4	20	0	0	23	6	8
	900	11	5	0	15	0	0	18	15	0	22	10	0	26	5	0
	1000	12	10	0	16	13	4	20	16	8	25	0	0	29	3	4
	2000	25	0	0	33	6	8	41	13	4	50	0	0	58	6	8
	3000	37	10	0	50	0	0	62	10	0	75	0	0	87	10	0
	4000	50	0	0	66	13	4	83	6	8	100	0	0	116	13	4
	5000	62	10	0	83	6	8	104	3	4	125	0	0	145	16	8
	10000	125	0	0	166	13	4	208	6	8	250	0	0	291	13	4

The Price of the Commodity by the Tun, Hundred, Pound, Ounce, Dozen, Yard, Ell, &c.

	Num.	8 Pence.			9 Pence.			10 Pence.			11 Pence.			12 Pence.		
		l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.
bought or ſold.	1		0	8		0	9		0	10		0	11		1	0
	2		1	4		1	6		1	8		1	10		2	0
	3		2	0		2	3		2	6		2	9		3	0
	4		2	8		3	0		3	4		3	8		4	0
	5		3	4		3	9		4	2		4	7		5	0
	6		4	0		4	6		5	0		5	6		6	0
	7		4	8		5	3		5	10		6	5		7	0
	8		5	4		6	0		6	8		7	4		8	0
	9		6	0		6	9		7	6		8	3		9	0
The QUANTITY	10		6	8		7	6		8	4		9	2		10	0
	20		13	4		15	0		16	8		18	4	1	0	0
	30	1	0	0	1	2	6	1	5	0	1	7	6	1	10	0
	40	1	6	8	1	10	0	1	13	4	1	16	8	2	0	0
	50	1	13	4	1	17	6	2	1	8	2	5	10	2	10	0
	60	2	0	0	2	5	0	2	10	0	2	15	0	3	0	0
	70	2	6	8	2	12	6	2	18	4	3	4	2	3	10	0
	80	2	13	4	3	0	0	3	6	8	3	13	4	4	0	0
	00	3	0	0	3	7	6	3	15	0	4	2	6	4	10	0
	100	3	6	8	3	15	0	4	3	4	4	11	8	5	0	0
	200	6	13	4	7	10	0	8	6	8	9	3	4	10	0	0
	300	10	0	0	12	5	0	12	10	0	14	15	0	15	0	0
	400	13	6	8	15	0	0	16	13	4	18	6	8	20	0	0
	500	16	13	4	18	15	0	20	16	8	22	18	4	25	0	0
	600	20	0	0	22	10	0	25	0	0	27	10	0	30	0	0
	700	23	6	8	26	5	0	29	3	4	32	1	8	35	0	0
	800	26	13	4	30	0	0	33	6	8	36	13	4	40	0	0
	900	30	0	0	33	15	0	37	10	0	41	5	0	45	0	0
	1000	33	6	8	37	10	0	41	13	4	45	16	8	50	0	0
	2000	66	13	4	75	0	0	83	6	8	91	13	4	100	0	0
	3000	100	0	0	112	10	0	125	0	0	137	10	0	150	0	0
	4000	133	6	8	150	0	0	166	13	4	283	6	8	200	0	0
	5000	166	13	4	187	10	0	208	16	8	229	3	4	250	0	0
	10000	233	6	8	375	0	0	416	13	4	458	6	8	500	0	0

The

The Deſcription and Uſe of the preceding TABLE.

THE firſt Column towards the Left Hand contains the Quantity of any Commodity bought or ſold, from 1 Pound, 1 Yard, 1 Dozen, 1 Ell, 1 Peck, 1 Buſhel, 1 Pipe, 1 Barrel, 1 Gallon, or the like, to 10,000 Pounds, Yards, Ells, &c. in this Order; the Column beginning with 1, 2, 3, &c. to 9; then 10, 20, &c. to 90; then 100, 200, &c. to 900; then 1000, 2000, 3000, 4000, 5000, and 10,000; at the Side of which Column are printed theſe Words, The Quantity bought or ſold.

At the Top of the Table is the Price of any Commodity from 1 farthing the Pound, Yard, Ell, &c. to 1 Shilling the Pound, Yard, Ell, &c. in this Order; over the firſt Column is 1 farthing, over the ſecond 2 farthings, over the third 3 farthings; then 1 Penny, 2 Pence, 3 Pence, &c. to 12 Pence the Pound, Yard, Ell, &c. Note, That l. ſtands for Pounds, s. for Shillings, d. for Pence, and q. for Farthings, at the Head of each Column.

This Table is of ſuch general Uſe, that it may be applied almoſt to any thing in buying or ſelling, or retailing of Commodities, either with Gain or Loſs, and its Uſes are ſo manifold that a Volume might be written of it. I ſhall inſtance in ſome of the moſt generally uſeful Examples, which whoſoever knows rightly how to perform, he may apply the Table to whatever Uſe (in his Buſineſs) he hath Occaſion for it.

Queſt. 1. At 1 q. the lb. what will 70 lb. weight come to?

Look in the Table (in that Column that hath 1 farthing at the Head thereof) and againſt 70, the Number of Pounds to be bought, in the firſt Column toward the Left Hand, you will find 1 s. 5 d. 2 q. and ſo much will 70 lb. weight coſt at 1 farthing the Pound; and ſo you ſhall find

		l.	s.	d.	q.
7	Pound Weight, Ounces, Pints, &c. at 1 q. the lb. will come to	0	0	1	3
30		0	0	7	2
700		0	14	7	0
4000		4	3	4	0
10,000		10	8	4	0

What is here ſaid of 1 farthing the Pound, &c. the like is to be underſtood of 2 farthings, 3 farthings, 1 Penny, 2 Pence, &c. 1 Shilling, 2 Shillings, &c. as by the following Queſtions will appear.

Queſt. 2. At 5 d. the Yard, what will 200 Yards amount to?

Look in the Column that has 5 Pence at the Head thereof, and againſt 200 (in the firſt Column) you will find 4 l. 3 s. 4 d. and ſo much will 200 Yards come to at 5 d. a Yard. And ſo in the ſame Column you will find that

9	Yards at 5 d. a Yard will come to	0	3	9
50		1	0	10
800		16	13	4
3000		62	10	0
10,000		208	6	8

Queſt. 3. If I buy 30 Pints for 1 s. 10 d. 2 q. what is that a Pint?

Look for 30 (the Number of Pints bought) in the firſt Column towards the Left Hand, then caſt your Eye along that Line (towards the Right Hand) 'til you find the Sum which the Pints coſt, viz. 1 s. 10 d. 2 q. which you find in the third Column from the firſt, at the Head whereof ſtands 3 farthings; ſo that each Pint coſt 3 farthings.

Queſt. 4. If 50 Quarts of Wine coſt 1 l. 17 s. 6 d. what is that a Quart?

Look for 50 in the firſt Column of the Table, then caſt your Eye on the other Columns in that Line in which 50 ſtands 'til you find 1 l. 17 s. 6 d. which when you have found, look what Sum ſtands at the Top of the Column, and that is the Price of the Quart.

So in the Example 1 l. 17 s. 6 d. will be found to ſtand againſt 50 (in the firſt Column) in that Column that hath 9 d. at the Head thereof; ſo that 9 d. is the Price of one Quart. And ſo you may find that

			l.	s.	d.		
If	800 Yards of Tape	coſt	0	16	8	One ſtands me in	1 q.
	60 Braſs Nails		0	3	9		3 q.
	500 Pounds of Sugar		8	6	8		4 d.
	40 Yards of Baile		1	13	4		10 d.
	9 Gallons of Wine		1	16	0		4 s.
	800 Ells of Holland		360	0	0		9 s.
	1000 Books		41	13	4		10 d.

Queſt. 5. A Retailer buys 700 lb. Weight of Sugar, which coſt him 11 l. 13 s. 4 d. by the ſelling of which by Retail he is reſolved to gain 8 l. 15 s. At what Price by the Pound muſt he ſell his Sugar to make that Profit?

The Sugar coſt him	11	13	4
To which add the Profit he would make	8	15	0
The Sum is	20	8	4

Now the Queſtion will be, If 700 lb. Weight of Sugar coſt 20 l. 8 s. 4 d. what is that a Pound?

Look in the firſt Column of the Table for 700, and turn 'til you find 20 l. 8 s. 4 d. againſt it, which Sum you will find in that Column that hath 7 Pence at the Head; ſo that if he ſells his 700 lb. of Sugar for 7 d. a Pound, he will gain by it 8 l. 15 s.

Theſe and ſuch like Queſtions, where the real Number both of the Price and alſo of the Quantity of the Commodity bought or ſold, are found in the Table, and are, you ſee, reſolved without Pen, Ink, or Paper, (by Inſpection only;) but thoſe which follow are ſuch where either the real Number of the Quantity, or the real Sum of the Price (or both) cannot be found exactly in the Table; then the Aſſiſtance of Addition (which almoſt every Man can perform) will be required, as by the following Queſtions will appear.

Queſt. 6. At 5 d. the Pound, what will 735 Pound amount unto?

Look in the Column that hath 5 d. at the Head thereof, and you will find that at 5 d. the Pound Weight,

		l.	s.	d.
700	Pound Weight will come to	14	11	8
30		0	12	6
5		0	2	1
735	In all	15	6	3

So that 735 Pound at 5 d. the Pound will come to 15 l. 6 s. 3 d.

Queſt. 7. At 7 d. 3 q. the Quart what will 200 Quarts or 50 Gallons amount unto?

Look in the Column of 7 Pence, and you ſhall find that

200 Quarts at	7 d.	comes to	5	16	8
	3 q.		0	12	6
		In all	6	9	2

So that at 7 d. 3 q. the Quart, 200 Quarts or 50 Gallons will amount to 6 l. 9 s. 2 d.

Queſt. 8. At 7 l. 17 s. 9 d. 1 q. the 100 Weight of any Commodity, what will 900 Weight come to?

	l.	s.	d.	q.		l.	s.	d.	q.
900 Wt. at	5	0	0	0	comes to	45	0	0	0
	2	0	0	0		18	0	0	0
	0	10	0	0		4	10	0	0
	0	7	0	0		3	3	0	0
	0	0	9	0		0	6	9	0
	0	0	0	1		0	0	2	1
	7	17	9	1		70	19	11	1

Theſe two laſt Queſtions are ſuch where the real Price of the Commodity could not be exactly found in the Table in one Sum. The Queſtions following are ſuch where neither Price nor Quantity can be exactly found in the Table in one Sum; and in them are all the Varieties that can be propoſed.

Queſt. 9. At 7 s. 3 d. a Yard, what will 37 Yards come to?

30 Yards	at	7 s.	the Yard comes to	10	10	0
30		3 d.		0	7	6
7		7 s.		2	9	0
7		3 d.		0	1	9
			In all	13	8	3

Queſt. 10. At 5 l. 19 s. 11 d. 3 q. the Tun, what will 162 Tun come to?

		l.	s.	d.	q.						
100	at	5	0	0	0	comes to	500	0	0	0	
60							300	0	0	0	
2							10	0	0	0	
100		0	10	0	0		50	0	0	0	
60							30	0	0	0	
2							1	0	0	0	
100		0	9	0	0		45	0	0	0	
60							27	0	0	0	
2							0	18	0	0	
100		0	0	11	0		4	11	8	0	
60							2	15	0	0	
2							0	1	10	0	
100		0	0	0	3		0	6	3	0	
60							0	3	9	0	
2							0	0	1	2	
162		5	19	11	3		971	16	7	2	Anſw.

Now the Queſtion laſt propounded being as intricate almoſt as I could think of, may be much abbreviated, as in the following Work, thus: For 5 l. 19 s. 11 d. 3 q. wants but 1 q. of 6 l. wherefore if you compute what 162 Tun will amount unto at 6 l. the Tun, and from the Sum thereof ſubſtract what 162 Tun at 1 q. the Tun amounts to, the Remainder will anſwer the Queſtion, viz.

100	at	5	0	0	0	comes to	500	0	0	0
60							300	0	0	0
2							10	0	0	0
162		1	0	0	0		162	0	0	0
						In all	972	0	0	0

100	at 3 q. a Tun	comes to	0	2	1	0
60			0	1	3	0
2			0	0	1	2
		Total	0	3	5	2

Subſtracted from 972 l. leaves 971 16 7 2
as before, and above half the Labour ſaved.

Thus have I given a large and ſufficient Explanation of each particular Part of the preceding Table, by which vaſt Numbers of Arithmetical

Queſtions, as well thoſe relating to the Rule of Three, as in many other Caſes of buying and ſelling, &c. are reſolved, and which ſaves a tedious Multiplication and Diviſion, if well underſtood.

The QUANTITIES *of particular* GOODS *in the* Wholeſale Trade, *as they are found in the* Books of Rates: *With ſhort Rules for the more ready caſting them up: Likewiſe the particular Number, Weight, or Meaſure by which ſeveral Sorts of Goods are uſually ſold.*

I. GOODS Sold by the THOUSAND.

PAST-BOARD for Books; Tennis Balls; Lemons, and Oranges; Teazels; Flanders Paving, and Pantiles; Lanthorn Horns; Barrel Hoops, and Boards; Quills; Squirrel-Skins; Ox-Bones; Yards of Liſt, &c.

The RULE to caſt up Goods of this Quantity, is; Multiply the Pence that one coſts by 50, and divide the Product by 12, it gives the Value of a Thouſand.

Examp.

$\frac{1000}{240} \Big| \frac{50}{12} \Big|$ or $\frac{25}{6}$ of 20s.

What comes 1000 of Barrel Hoops to, at 3 d. each?

```
         3
        50    l.  s.
   12) 150 (12  10 per 1000.
       3 (6
```

If 1000 of Squirrel-Skins coſt 11 l. 5 s. what is that per Skin?

```
        11   5
            12
 5)0 13)5    0
    2 d. 2 q. 4-5 per Skin.
```

II. GOODS Sold at SIX SCORE to the HUNDRED.

Lamb-Skins; Balks; Great, Middle, and Small Clap-Boards, Pipe-Boards, and Bow-Staves; Deal Boards; Sparrs of all kinds; Codfiſh, Cole, Ling, and all ſorts of Stockfiſh; alſo many Sorts of Linnen, viz. Hambourg, Sileſia, Muſcovy, Weſtphalia, Hanover, Iriſh, &c.

To caſt up Goods of this Quantity, take half the Pence of the Price of one Ell, &c. which gives the Value of 120 in Pounds, Shillings, &c. $\frac{120}{240}$ being the half of a Pound Sterling.

Examp. What comes 120 Ells of Canvas to, at 5 d. halfpenny per Ell?

2) 5 : 1-2

2 15 Anſw. 2 l. 15 s.

NB. That you allow each Penny the Remains, (in the firſt Examp.) as 20 s. and every 20 s. as one Penny, (in the ſecond;) as for Example, the firſt there remains one Penny, which reckon 20 s. and accordingly the halfpenny in the given Price for 10 s. both which making 30 s. dividing it by 2, gives 15 s. and ſo the Anſwer is found to be 2 l. 15 s.

III. GOODS Sold by the GREAT GROSS, containing Twelve SMALL GROSS, which is equal to 144 Dozen.

Buttons of Metal; Glaſs; Thread, Silk, and Hair; Beads of Bone, Box, Glaſs, or Wood; Cap-Hooks; Cheſs-men; Tobacco Pipes; Combs of Light or Box Wood; Thread or Silk Points, Playing Cards, &c.

Goods of this Quantity are caſt up thus; multiply the Pence of the Price of one Dozen by 3, and divide the Product by 5, gives the Value of a Great Groſs in Pounds; $\frac{144}{240}$ being the 3-5th of a Pound Sterling.

Examp. What comes a Great Groſs of Silk Buttons to, at 8 d. halfpenny per Dozen?

8 1-2

3

5)25 1-2 (5 l. 2 s.

5 2

What comes 1 Dozen to, when a Great Groſs coſts 7 l. 8 s.?

7 8

5

3)37 0 (12 d. 1 q.

IV. GOODS Sold by the SMALL GROSS of 12 Dozen.

Tobacco; Pepper; Boxes; Neſt and Tinder-Boxes; Buckles of ſome ſorts; Waſh-balls; Ink-horns; Bodkins; ſeveral ſorts of Knives; Comb-caſes, &c.

Goods of this Quantity may be caſt up by the laſt preceding Rules, ſince there are as many Particulars in a Small Groſs as Dozens in a Great Groſs.

V. GOODS Sold by the FIVE SCORE to the HUNDRED.

Capers; Thrums; Ginger; Cloves; Indico; Croſs Bows; Thread; Packthread; Kids or Goats Hair; Quickſilver; Cotton; Wool; Engliſh Hard Wax; Braſs and Latten Work; Chafing-Diſhes and Irons; Laver-Cocks, &c.

To caſt up which ſort of Goods, multiply the Pence of the Price of one Pound Weight by 5, dividing the Product by 12, $\frac{100}{240}$ being the $\frac{5}{12}$ of a Pound.

Examp. What comes 100 lb. Weight of Roots to, at 15 d. per Pound?

15
5 l. s.
12)75 (6 5 Anſw.

What comes 1 Pound to, when 100 Pound coſt 14 l. 15 s.?

14 15
12 d. s. d.
5) 177 0 (35 2-5th. or 2 11 2-5

VI. To Value GOODS Sold by the COMMON HUNDRED, of 112 Pound to the Hundred.

Multiply the Pence that one Pound coſts by 7, and the Product divide by 15, gives the Value; being $\frac{112}{240}$ or $\frac{14}{30}$ or $\frac{7}{15}$ of a Pound.

Examp. What comes a Hundred Weight or 112 Pound to, at 8 d. 3 q. per Pound?

8 3-4
7 l. s. d.
15)61 1-4 (4 1 8 C. wt.

At 9 l. per C. Wt. what comes 1 Pound to, at that Rate?

9
15 d.
7)135(19 1-4 1-7. or 19 d.
6 1 q. 1-7. per lb.

DIRECTIONS *how to find the Diſtance of any two Places on a* Globe, *or* Map, *that has no Scale of Miles, Leagues, &c.*

AS to a Scale in particular Maps, it wholly depends upon the Degrees of a great Circle, and the Proportion of Miles in each Country to ſuch a Degree; for the Diſtance of any two Places being taken with a Pair of Compaſſes, and applied either to the Eaſt or Weſt Side of a Map, which is the Scale of Latitude, it ſhall give you the Number of Degrees that thoſe two Places are diſtant from one another, which Number of Degrees ſo found, if multiplied by 69 and a half, gives the Diſtance in

Engliſh Statute Miles; or by 73, you have the Diſtance in Geometrical or Italian Miles; by 25, for French common Leagues; by 17 and a half, for Spaniſh Miles; by 15, for the common German, Dutch, Daniſh, and great Poliſh Miles; by 10, for Hungarian Miles; by 12, for Swediſh Miles; by 80, for the Muſcovian Verſtes or Vereſt; by 480, for the Grecian Stadia; by 20, for the Perſian, Arabian, and Egyptian Paraſanga, now call'd Farſach; by 24, for the Mogul or Indian Cos; by 250, for the Chineſe Stades; by 400, for the Ikins of Japan: But for the Turks, I can't find that they have any Diſtinction of their Ways by Miles, nor of their Days by Hours.

ADVERTISEMENT.

WRITING, and ARITHMETIC, in all its Parts, *viz.* Whole Numbers, and Fractions, Vulgar, Decimal, and Duodecimal, are Taught by this Author, after the beſt Method: Alſo *Geometry*, *Trigonometry*, *Navigation*, *Dialling*, *Gauging*, *Surveying*, *Uſe of the Globes*, *Quadrant*, *Sector*, &c. Likewiſe Youth Boarded, and Perſons Taught Abroad.

FINIS.